

An Interview with  
CONSTANCE MCLINDON  
OH 465

Conducted by Jeffrey R. Yost

on

22 September 2009

Reston, VA

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Center for the History of Information Technology  
University of Minnesota, Minneapolis  
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### Abstract

With support from the National Science Foundation (Grant No. 0811988, “Designing and Using FastLane: Distilling Lessons for Cyberinfrastructures”) CBI researchers Jeffrey Yost and Thomas Misa conducted oral history interviews with 70 NSF staff members as well as numerous additional interviews during 29 university site visits. An overview of the project is available at <[www.cbi.umn.edu/oh/fastlane/](http://www.cbi.umn.edu/oh/fastlane/)> and a complete set of 643 publicly available interviews is at <[dx.doi.org/10.13020/D6RG6B](https://dx.doi.org/10.13020/D6RG6B)>. Here on the CBI oral history database is a selection of notable NSF staff including Joseph F. Burt, Jean Feldman, C. Suzanne Iacono, Constance McLindon, Carolyn L. Miller, Paul Morris, Andrea T. Norris, Erika Rissi, Craig Robinson, Mary F. Santonastasso, Rich Schneider, Frank P. Scioli, Beverly Sherman, George Strawn, and Frederic J. Wendling. Topics common to many of the interviews include the design and development of the NSF’s FastLane computer system, interactions with users, e-government initiatives, grants management practices, peer review, and NSF policies and practices. These interviews span a wide range of NSF staff, from program officers to senior managers.

Connie McLindon was a high-level supporter of FastLane who worked closely with Fred Wendling to launch FastLane in the early 1990s.

Yost: My name is Jeffrey Yost, from the Charles Babbage Institute at the University of Minnesota. I'm here today with Connie McLindon. It's September 22, 2009. We're in Reston, Virginia. Connie, can you begin by discussing your education, your degrees, and the years of your degrees?

McLindon: I have an undergraduate degree in American Thought and Civilization from George Washington University and a master's degree in Math and Sciences from the American University.

Yost: Following completion of your master's degree, can you briefly outline your career?

McLindon: The master's degree was part of a program at the Department of the Army, where they selected "X" people to go for a six-month program, accelerated curriculum, to get a master's degree in, basically, IT. At the conclusion of that, we were all given jobs as programmers. I moved up the line from a programmer, to an analyst, to a senior analyst; and then I found this opportunity on the Pentagon Job Vacancy Announcement at an organization called Defense Advanced Research Projects Agency [DARPA], which I'd never heard of. I applied for the job, knowing it sounded very different. I was in a very normal, typical IBM mainframe environment, although I had done, at that point, some "teleprocessing." I had set up the first interactive system there. So anyhow, I applied for the job at DARPA; six months later I got a call asking me to come over for an interview, which I did. They interviewed me and the other 6 or 7 finalists together. I was the only woman and the first candidate of the group to be interviewed. Then they took us out of

the room and brought each candidate back in reverse alphabetical sequence, and I was the first back in. At the end of the process I returned to my job at the Pentagon and decided DARPA was not for me. I had already read a lot about DARPA and knew they were using experimental systems to do most of their work. They had a PDP-15 DEC, that was their database management server, running an obscure database management system that was not on the market. Somebody from MIT wrote it overnight. But, I made the short, short list, was called back in to meet the Director, Dr. Steve Lukasik, soon thereafter, was offered the job, which I really considered turning down.

Yost: What was the job title?

McLindon: Director MIS. Despite my concerns, I accepted the position and that job obviously changed my life. It provided me with a significant amount of experience in technology that I had never been involved with. It was 1973, the very early stages of what we're now calling the internet applications. From the vantage point of my job, I worked very closely with all the research people in the Information Techniques Processing Office (ITPO), and took over program management responsibilities for some of those projects they had including ISI, SRI, Institute for the Future, several other places. So I was thrown into the research world and eventually learned. (Laughs.) So it was not easy but a wonderful experience.

Everybody had a huge GE terminal, and we used that terminal to log on to California ISI. This is how we were doing things in those days. Larry Roberts, who was head of the IPTO office would come in one morning and say, I just wrote this last night, let's get it up

and running. It would be some email read mail application, and it had bugs and all that. But it was fun and there were very bright people there, including Bob Kahn. But I wanted to move on and even though I got promoted there, I wanted a higher promotion. A job came up at NSF, I interviewed for it and got it. That job was Director, Information Technology in a directorate called Administration.

Yost: When you were at DARPA and they were using these experimental systems, what was the goal in doing that? Was that to better understand the cutting edge research in IT and make better programmatic decisions with funding, or what was the logic behind that?

McLindon: The goal was much broader than that. It was to develop technological tools that would assist the Defense Department in pursuing its mission. We had to teach new people coming in to DARPA about this emerging technology. It was a small organization but there was frequent turnover. A lot of military people came in who had no background in any of this technology, so part of the job of the people who worked for me was to teach new staff how to read mail and send mail. We were doing a lot of interesting things. We were all using computers at ISI and SRI and MIT that were running TENEX, and TENEX was the operating system that really enabled all this to happen.

Yost: How did working at DARPA, and in this environment, change your perspective on IT and opportunities for IT?

McLindon: It made me realize that the staid, conservative approach wasn't the only approach. I was into experimentation and trying to do different things; not at the expense of the organization. But NSF was a totally different place. Many people at NSF were worried about me because they knew I was from a research organization – they wanted systems' improvement, not experimentation. So I had to be careful when I got in there. The IT situation at NSF, when I got there in 1980, was a disaster, an absolute disaster.

Yost: So they didn't hire you with the idea that you would bring in the latest IT?

McLindon: I think they thought I would do a good job, whatever that was at the time. There was an old Honeywell mainframe there that was also running a unique operating system, not supported by anybody, written by kids at Dartmouth. It failed like once a week for five hours, or more. You just couldn't carry on a business that way. NSF is 100 percent bigger than DARPA -- or was -- and that system was running everything for NSF. At DARPA, DOD handled the personnel files and the budgets and all that. DARPA had responsibility for its internal ARPA order files and related data. At NSF, everything was processed. So it was a big job. I had to get rid of the Honeywell; change some staff. It was a rough couple of years.

Yost: How large was the division for information systems when you arrived?

McLindon: Very large. We probably had 80 staff and many contractors. I don't remember, really, it was 1980. (Laughs.) All I know is it was large and challenging, and

many who previously had been in the job that I was hired for, had moved to different positions at NSF. When I was interviewed for the job, some of the people who interviewed me told me not to take it, if offered; it's a horrible job. So the day I was offered the job I turned it down. The Assistant Director for Administration asked me what it would take to change my mind. I told him that if I found problems I wanted to be supported by management; if I had to make personnel or technological changes, for instance. He said, "You've got it."

Yost: Who was this?

McLindon: Kurt Sandved, a wonderful manager. There was significant change for awhile. Since I was in the Directorate of Administration, one of my fellow division directors was director of financial management. He controlled the funds, so anything I wanted I had to go through him first and then the Deputy and Director of Administration. At that point, PCs were just coming out, and I wanted one for everybody. I was writing a long range plan and the Director of Financial Management said, forget it, I will only give you funds for one for four people, something like that. So there was all this back and forth. Finally, I wrote a long range plan that said that one out of every four people would get a PC, and I was actually at that point happy to even get that approved within the Administration Directorate.

Then Erich Bloch from IBM was named the new Director of NSF in 1984. I went to IBM to meet with him and I showed him the long range plan. He laughed. He said it was totally ridiculous and unacceptable. Everybody should have a PC. Several months after

he arrived at NSF, he reorganized some offices, including reassigning my division to the Office of the Director. I became the Office Director, Office of Information Systems. Erich completely transformed the IT environment at NSF. He told the Director of Financial Management to plan to automate all financial processes. Funding became available to provide each staff member with a PC.

Yost: There was also a move from the Honeywell mainframe environment to HP-made computers. Was that prior to this, in the early 1980s?

McLindon: Yes.

Yost: Can you discuss that transition?

McLindon: We got three HP minicomputers to replace the Honeywell. I had had experience with HPs at DARPA when we decided to move from the PDP-15. That involved a new database management system, and HP was not into TCP/IP, which was a problem for NSF. We eventually acquired an IBM mainframe.

Around 1986, I met with a group of people from all the directorates in NSF – an advisory group, and we came up the idea of starting EXPRES [Experimental Research in Electronic Submission]. We went to Erich, and after a detailed analysis of the concept and goals, he approved a significant program. We put out an RFP; Carnegie Mellon and University of Michigan were selected. The idea of the EXPRES was to focus on the compound document issues. We wanted anybody from any university to send a proposal

in any way they wanted to. We knew that meant being able to process multiple, totally different, compound documents. We did that research for several years, and it was very challenging.

Yost: Was there universal backing among the different directorates behind this EXPRES program or was it controversial within NSF?

McLindon: In general there was significant support. It didn't affect the day-to-day life in NSF because the research was done by PIs and discussed by advisory groups. Initially the program did not focus on the review of proposals online. Vint Cerf chaired the EXPRES advisory group, and many excellent NSF people worked on the program, including Al Thaler, a mathematician, who was program manager and Dave Staudt, a technologist. After a few years EXPRES was transferred to CISE and cancelled at some point later. In 1993 or 1994 there was discussion about starting a new program that would address all aspects of proposal submission and review. Fred Wendling had proposed the idea of FastLane as the name, and I went to Neal Lane, who was Director then and said, "Do you mind if we call it FastLane, after you?" He said no, and that's how FastLane was initiated. We wanted to be able to handle documents coming in on Windows platforms and Mac platforms but there were rules, unlike EXPRES. We brought the financial and grant people into the process and included their requirements. It had a good beginning and, obviously, it's doing very well. I left NSF in February 1996. And Fred Wendling was really the one who was more involved.

Yost: Moving back to the conceptualization of EXPRES, can you talk about how your previous contacts and network of individuals influenced your thinking in launching that research project?

McLindon: I knew there were good people out there who would like to address a hard issue, and I spent a lot of time, in the beginning, in the early days, talking to Vint and other people about whether this was even worthwhile to promote to Erich. They all agreed, yes. Within NSF, there were many people who thought it was a good idea. My own experience at DARPA, where they were combining the IT mission with doing research, I thought, had a lot of benefits. So there were many factors involved in starting the program.

Yost: Before Erich Bloch came on, was there great resistance to that perspective that you brought? Can you talk about that?

McLindon: I didn't surface it. I mean, I was having enough trouble getting PCs for people, much less saying, "oh by the way, let's try" — no, I didn't even bring it up.

Yost: So in that environment you just tried to keep things going?

McLindon: First, I made many changes with great support from the people who hired me. There were many personnel issues that got really tough. In some cases I had to be

deposed and cases went to court. At the same time I was trying to manage the transition from the Honeywell.

Yost: I understand you hired Fred Wendling fairly early on.

McLindon: Yes.

Yost: Can you discuss that, and why you decided to hire Fred, and for what type of role?

McLindon: I met him after I'd been there a month. He seemed smart, energetic and he was in one of the directorates doing some IT work. I had the opportunity to hire him and he started in a fairly junior job, and worked his way up. Fred was diligent and curious and creative. And is, I'm sure, still very impressive. You could count on him to come up with innovative plans for systems' improvements and do very well. Emerging technology assessment was a big part of our mission. Fred and several other staff members would join me on visits to lots of different companies to figure out what was coming out, what was new. In one case, Fred and I were meeting with the CEO, who was also very technical, and she mentioned that there was a problem with the way their router was working; Fred figured it out for her. He's a very bright person.

Yost: So one of the early roles you gave to him was assessing new technology?

McLindon: No. I don't remember his first job but I think he was working in a team of people who were programming. As he progressed he became more involved in technology assessment. It's not like it was his job *per se*, it was just one area of involvement. A lot of interesting breakthroughs were happening in the 1980s. And we had very productive relationships with a lot of different organizations; including Apple, and eventually, NeXT.

Yost: Can you talk about some of the early networking companies that you visited and what you learned in visiting them?

McLindon: 3-Com, I guess, was the one we spent the most time with. We had — I don't know what they're using now — we had the largest 3-Com network in the country. We went to Bridge to look at routers, and focused on companies that would support TCP/IP. We finally decided on 3-Com and got good support from them. We looked at Cisco.

Yost: Did you know Bob Metcalf?

McLindon: Yes, I know Bob Metcalf.

Yost: Did you know him before, from DARPA days?

McLindon: I may have met him at DARPA. I don't remember where I met him.

Yost: Thinking back a bit, can you talk about the challenges of moving from the old building to a new building?

McLindon: (Laughs.) It's very simple. Nobody wanted to move. Hierarchy fought the move for a long time, and successfully so. We liked where we were. We were a block from the White House, OMB, everybody had already figured out their commute, and moving, especially to Virginia, did not appeal. But when Clinton came in, it became a mandate. Fred Bernthal who was deputy director, got a phone call from Vernon Jordan saying, Fred, you've got to move. Walter Massey was out of town. "It's over, you've got to move." With that, I was requested to go downstairs and stand in front of a GSA moving truck for a picture to make it definite. I think I had just started my new job, meaning I was in charge of the move. That was very challenging; not just because nobody wanted to move, but because of all the planning and the bureaucratic back and forth with OMB and GSA. We had a great group in my organization who made it all work. Bob Schmidt and Joe Burt did a great job in helping to plan and getting the plan done. We moved on time, which was quite an achievement, and the first people in the new building were not happy, but it's amazing how quickly they all settled in because the building turned out to be perfect. Good location, nice offices, restaurants. Staff ended up liking it. Complaints diminished rapidly. Neal Lane was a good director for that kind of thing; he was very soothing and he'd meet with the staff frequently. I had no experience in any of this, which, as it turns out, didn't matter because Bob Schmidt and his people were outstanding. Not only was everything moved on schedule, the computers and networking worked – really remarkable. That was 1993-1994.

Yost: Did that present any particular challenges to the IT infrastructure or opportunities to change the IT infrastructure at NSF?

McLindon: We had spent a considerable amount of time planning the move of all the computers and networking devices we had at G street, all of which were fairly new infrastructure, and they worked when installed. Really remarkable considering the large number of systems we had and the potential for problems. I don't really remember any challenges, and there certainly may have been opportunities because of the new building. Again, I've been gone a long time (laughs) and 1993 was a really long time ago. I don't remember any major issues with that, but Fred would know.

Yost: I'd like to ask some questions about the history of the implementation of email at NSF. Can you tell me how that originated?

McLindon: When I came from DARPA, there was no email at NSF.

Yost: No one at NSF was using it?

McLindon: No. I thought it was embarrassing. Lou Branscomb, of IBM, was Chairman of the Board so I went to him and I said what do you think if we get some of the members of the board on email and he said, good idea. So we actually bought time on a commercial system.

Yost: Dialcom?

McLindon: Yes. And then we started providing it to staff, and some were really pleased. Then we realized we couldn't keep using a commercial system; we needed our own. We then created a system called NOTE, which may still be there, I don't know. So everybody eventually got online, but it was a hard sell in the beginning. But in general, staff were pleasantly surprised about the many benefits. Of course, they both used and misused email, like many other companies do. But Lou Branscom was the one who spearheaded it to begin with; and then, of course, Erich Bloch, when he came in, did support it.

Yost: In starting the EXPRES research project, was there a sense of a need for greater operational efficiency at NSF, in terms of looking at the trend line of proposals and for funding awards? That was going up, as I understand it, but staff size wasn't, so did that factor into the rationale or the discussion with EXPRES?

McLindon: Not really. All of us who had any background or understanding of IT knew it was not smart to be getting proposals in on paper from all over the world and then having to make copies of that paper and then send it back out — it just made no sense. It really wasn't, as far as I remember, based on "oh, we're getting more proposals," because I'm sure we were; and spending more money, which I'm not sure we were. No, it was just that this was an antiquated approach. When starting EXPRES we didn't want any standards'

limitations, such as you must submit the proposal in ASCII. We wanted to bite the compound document bullet, and it was hard to do; harder than we all thought.

Yost: Did you learn that during the EXPRES project or later on?

McLindon: During the EXPRES project.

Yost: At what point were your first interactions with interagency groups regarding applications and networking within governmental agencies?

McLindon: When I was at NSF I was on many committees consisting of senior government people who would sit around a table and talk about sharing and networking, but the reality is, to my knowledge, it still hasn't happened. Basically, it's a stovepipe environment. You can do your processes the way you want to at Treasury, and I can do what I want to at NSF.

Yost: Was there interest among other agencies about the EXPRES project?

McLindon: Not to my knowledge. We didn't promote that.

Yost: As I understand it, there was a postmortem meeting regarding EXPRES. Can you discuss that meeting and what sense there was of what NSF would do moving forward?

McLindon: When was this?

Yost: In 1989.

McLindon: I don't even remember any meeting. Was I there? (Laughs.)

Yost: I think so, but I'm not certain. I think Fred mentioned that the two of you were there.

McLindon: I'm drawing a blank on that.

Yost: When Erich Bloch came in, in 1984, can you speak a bit more about how he changed the environment regarding goals and needs within NSF for different, or greater, or better IT infrastructure?

McLindon: He made it very clear from day one that NSF had to move to an electronic way of doing business, period. We had quarterly reviews with him; each senior person would have a quarterly review with him and his immediate staff and he'd basically quiz us about progress. What have you done about any number of things? The pressure was very intense to get with the program. When he arrived at NSF, he told the secretary he wanted her to have a PC. She started crying and said, "Oh, Mr. Bloch, I can only use a typewriter; and he said, "No, you can use a PC. You'll get help to learn about it, and you will like it!" So it was that kind of thing everywhere. He created the Directorate for

Computing Sciences and Engineering [CISE], consisting of portions of divisions from various directorates. He made it very clear that he wanted NSF to be a fast-forwarding kind of an organization and woe to you who ignored that. And he made sure that an appropriate amount of funding was provided to get innovative research done.

Yost: Can you talk about the budget prior to his arrival; the budget you were working with versus after Erich Bloch came to NSF?

McLindon: I don't remember that, but my budget didn't go up that dramatically. I don't know the details of how the PC purchase was funded, but don't think it was from the OIS budget. My position, the Director of the Office of Information Systems, was always under fire, so I was always being reviewed by various program officers and senior executives. As a result of each one of those reviews, I'd end up getting more staff and a higher budget, so it worked out very well. (Laughs.) More staff, yes, it was amazing.

Yost: Do you recall if the IT coordinating committee began at NSF when you were there and can you talk about the origin of that committee?

McLindon: There was always the equivalent of an IT — I don't know whether you'd call it coordinating — an IT committee. I was interviewed by that group, at the time before I even joined NSF. Then people change, the pressure changes sometimes, meaning there's no pressure, sometimes there was. So, yes, we always went to these meetings and people would want to know what was going on and that kind of thing. It was constant the whole

time I was there. The interaction was very helpful for NSF and for my organization specifically.

Yost: With EXPRES, can you discuss the different roles key individuals had with that project?

McLindon: In the beginning, I was the Project Leader. Al Thaler, who was in Math, I think, at the time, was the Program Manager, and a major contributor. Dave Staudt, a technologist who worked in OIS was a key to the project also... We had senior technicians from both Carnegie Mellon and Michigan onsite, an important element in ensuring that PIs were working together. The rest of us were involved, like Fred, but they were not assigned specifically just to EXPRES

Yost: Following that project, was electronic proposal submission still on the front burner?

McLindon: Yes. Well, it was on *a* burner. (Laughs.) Yes. We hadn't given up. That research project was obviously too expansive, so we tried something more contained, I guess is the right word.

Yost: Can you elaborate on that?

McLindon: Obviously, we couldn't handle compound document submissions from anybody, anywhere, our main objective. I think there is a prescribed format for input to FastLane, very prescribed. Even though you can submit proposals through Apple or Windows systems, and so forth, you still need to fill out a form. I don't know all the details anymore.

Yost: We ran across the name Paul Chapin, who I understand was a researcher on detail.

McLindon: On detail to what?

Yost: To NSF. Did he have any role in planning or research on electronic proposal submission, do you recollect?

McLindon: Paul Chapin I thought was an employee, not on detail. He may have been.

Yost: On detail to your group, perhaps?

McLindon: No, I don't remember that. He was one of the people who could have been on an advisory group. He was always very interested in the IT mission and a very helpful advocate.

Yost: Can you give me a sense of your thinking in proposing the first meeting regarding FastLane, with Neal Lane? Was there any trepidation on your part? Did you think it would move forward?

McLindon: The meeting with Neal that I recall was about the project name, FASTLANE. I think there was already agreement on the project.

Yost: But did he provide authorization for the project?

McLindon: He must have. I don't remember the process.

Yost: So, in general, was he supportive?

McLindon: Yes, he was very supportive.

Yost: Do you recall the initial budget that was asked for, to get the project started?

McLindon: FastLane?

Yost: Yes.

McLindon: No. I really have no idea. I'm not even sure there was a specific budget. There must have been a line item for it but I don't know. Fred would know.

Yost: I understand at NSF that the source of the money is important in terms of administrative funds versus research funds. Can you talk about where the money came from? Was it tapping into research funds for FastLane's development?

McLindon: I doubt it. FastLane involved all the staff, with specific involvement of grants and contracts and financial management people; everybody had their input on this. It was pretty administrative, not research-y, but frankly, I don't remember. I would think not research. EXPRES was all research.

Yost: So, to your recollection was FastLane coming out of your general budget?

McLindon: I don't have a recollection. I don't know.

Yost: Was it Fred Wendling's idea to name it FastLane?

McLindon: Yes it was, I mentioned that earlier. He came to me and said what about FastLane? I wasn't sure Neal would like it so I went and asked Neal; he said that's fine.

Yost: When you started the project what did you view as the greatest challenges to making it successful?

McLindon: It involved a lot of different challenges that we had not had with EXPRES, i.e., dealing with the financial management people, the grants and contracts people, trying to get everybody on the same wavelength in terms of what specs the system should have because, obviously, as a proposal comes in it's responding to questions from grants, and financial management requirements. So getting everybody together and getting them to agree was, I thought, going to be a challenge. But then I left, and I don't know what happened, but obviously something worked out.

Yost: So, getting internal buy-in?

McLindon: Not only buy-in but input. In other words, they had to give us their requirements and then they had to review what was emerging and see if it would work and if it met their standards. So it took a lot to do all that interaction.

Yost: At the start of the project, what was the thinking in terms of getting external buy-in and how important was that? What actions were taken in that regard?

McLindon: I don't remember but we probably had an advisory group, I'm not sure. That would be the way we normally would do it.

Yost: That would be composed of PIs and Sponsored Project personnel?

McLindon: Yes, definitely Sponsored Project personnel. But I don't know, I don't remember a lot of that.

Yost: Do you recall how you first heard about research at Illinois that resulted in Mosaic and the influence of that on the evolving FastLane project?

McLindon: That information had been out there for some time. We knew about Illinois. Illinois had some NSF money so we knew about that. We knew about Mosaic. We had visited Mosaic. They started in 1994. We visited them, I think, like two days after they opened. So we were very familiar with all that and it was an exciting time.

Yost: What did it mean for the FastLane project?

McLindon: I don't know that it meant anything to the FastLane project. The approach to FastLane was basically, get online, go the NSF website and find the documents that you have to fill out, fill them out, and send them in. Why, have you heard that it had an impact?

Yost: As a tool for the research community to interact and send their information to NSF; having a browser.

McLindon: I guess I'm uninformed. I don't remember thinking about that.

Yost: There was an initial set of, as I understand it, six objectives regarding FastLane. Can you discuss how those came about, what were the priorities?

McLindon: The objectives were the priorities, I assume. They included the more straightforward requirements that could actually be achieved. The working groups that were addressing all the many capabilities that were wanted decided to limit objectives, in the beginning.

Yost: Was there a sense of certain objectives connecting to get internal or external buy-in for the project?

McLindon: Clearly, we needed a buy-in from the finance people, from the grants and contracts people, that definitely had to happen. So you expect, in this list, some of the objectives are their priorities.

Yost: What about the external?

McLindon: Well, that too. Again, I'm assuming there was an outside group of advisors. We knew, for instance, that applicants wanted proposal status because we were getting phone calls requesting that.

Yost: I understand contractors were hired fairly early on, to work with you on the FastLane project. Can you talk about the selection process?

McLindon: No, I don't remember contractors.

Yost: That may have come after.

McLindon: Regardless of when it happened, the selection process must have been competitive.

Yost: That leads me to the question, can you talk about where FastLane was within your range of activities? Was it something that you spent a lot of time with? Was it just one of many projects that you were dealing with simultaneously?

McLindon: It was definitely an important project, but I was dealing with many others too. As I mentioned earlier, as Director, Office of Information and Resource Management [OIRM] I was responsible for three key divisions, each of which had significant responsibilities. They were Information Systems, Human Resources, and Administrative Services. As an example of other projects, we had a lot of issues in the new building regarding new security requirements, the cafeteria, and many others.

Yost: Do you recall to what extent discussions of information security and privacy were discussed and how that was dealt with in the early development of FastLane?

McLindon: No, and I don't know how it's dealt with.

Yost: Fred Wendling was obviously central to the development of FastLane.

McLindon: Yes he was.

Yost: Can you talk about other individuals and their contributions, and people that we should interview, as part of this project?

McLindon: No, and I really think you should ask him.

Yost: We did get some names from him.

McLindon: In addition to IT people, there were Financial Management and Grants and Contracts staff very involved as well.

Yost: In your last year or two at NSF can you describe where things were at with the FastLane project and your recollection of it?

McLindon: It was in the early stages, but after I left, in 1996, at some point, FastLane received a major award in New York which pleased us all. Then at CNRI, we became users, so I became familiar with it from that standpoint.

Yost: Can you discuss your decision to move to CNRI?

McLindon: I had been at NSF for a long time, and I was offered a great opportunity by Bob Kahn so I decided to take it. It was time; you know when it's time to go. (Laughs.) It worked out perfectly for me. CNRI is a wonderful organization that has made major contributions.

Yost: Did you continue to follow developments with FastLane at NSF?

McLindon: A little, in general, with NSF Gerry Glaser, who had been my Deputy when I left, would fill me in on what was going on and then, of course, I found out about the award. But I haven't really kept up with developments and what they're doing. Are they still working on it?

Yost: I think it continues to be refined, but it's a pretty stable system now, and in general, talking to users at universities, both sponsored project personnel and PIs, people seem pretty happy with it.

McLindon: That's good.

Yost: In fact, there's a fair amount of criticism of Grants.gov and how it's a much more difficult system to use.

McLindon: Whose system is that?

Yost: That was an attempt to be a government-wide system and I believe NIH is using that system now. But, even though that was the goal, at least to this point, researchers aren't forced to use that system so they have a choice of systems and most choose to use FastLane with NSF.

McLindon: Oh, so they could use Grants.gov and send a proposal to NSF?

Yost: That's my understanding.

McLindon: Oh. Now I see, I'm really out of it. (Laughs.) I haven't had an update on FastLane for a long time.

Yost: Can you tell me what you came to CNRI to do and what types of things you worked on there?

McLindon: When I went to CNRI I was given a project related to what's known as the Handle System, which is a research project that basically gives unique IDs to anything; documents, whatever; so that when you change your computer, when you change your browser, when you change anything, your document is still accessible. I focused on interacting with various groups that had interest in using the Handle System, assisting in helping them plan a transition to using the technology. It's now out there and very prevalent in the publishing industry where they use it to protect their content; especially

medical journals. So I did that for a long time. Then I became a vice president and took on some additional responsibilities associated with that, and continued to manage a team doing research regarding the Handle System and digital library concepts —known as Digital Object Architecture

Yost: I see that you were the recipient of the highest federal executive award, the Presidential Rank Distinguished Executive Award.

McLindon: Yes, I was, and I am very honored to have received that prestigious award twice.

Yost: Twice. Can you discuss that?

McLindon: I received the first award in 1989 and the second in 1995. — Typically these awards are for accomplishments throughout the individual's federal career. In my case they referenced some achievements at DARPA and later at NSF.

Yost: Congratulations.

McLindon: Thank you.

Yost: Can you describe the difference between how NSF looked at IT infrastructure from the time you arrived versus the time you left?

McLindon: I knew before I arrived at NSF that major changes had to be made to the IT infrastructure. There were serious problems that prevented staff from doing their jobs well, including a tone of cynicism and lack of interest in pursuing new, innovative ideas because of the IT environment. So, I'm very pleased that we were able to turn that around and get some new people; get rid of computers, get some new computers; get the PCs in; get people thinking about new things. Also important was interacting with the research community closely, as opposed to having them just be yet another part of the NSF organization. I interacted with them every chance I got, encouraging advisory groups, informal deliberations. We got a lot of good ideas from them. Basically, that's how EXPRES started because this group from outside of my office agreed that this was a good idea, so good that we actually received some funding from the directorates. (Laughs.)

Yost: So you must have seen it as a great challenge.

McLindon: It was a little overwhelming, actually. (Laughs.) The changes in personnel part was very hard for me. There was a lot of animosity among those people who were downgraded or whatever, understandably.

Yost: So there were personnel changes within your division that you initiated but also more broadly, in automating processes, did that provide challenges to the existing structure of NSF and were people concerned about being automated out of jobs?

McLindon: No. At least I never saw any of that.

Yost: People didn't lose their jobs because of automation?

McLindon: No. At the level of automation we had it would have been hard to remove a person. No, there was none of that. I don't remember any of that, anyhow. In general, good people were supportive of the IT changes. But they came slowly. In addition to transitioning from the Honeywell, we had to get going on networking, and with the PCs, and many other initiatives. But that was not threatening to people with jobs.

Yost: Can you talk about how changes in IT infrastructure brought about changes within NSF? Did it change the way people communicated? Did that lead to broader changes within organizational structure?

McLindon: Of course email changes everybody's environment and once they all got familiar with, and interested in email, they began to think of ways to change some of the things they were doing in their own directorates. It really started a lot of independent analysis which was good; not all coming from the central IT location. Even the most recalcitrant people bought into it after a while, either because they had to or because they wanted to. It was a major difference.

Yost: Can you talk about types and levels of resistance to moving towards more cutting edge information technology and to bringing the latest research within NSF? You mentioned that prior to Erich Bloch, you kind of kept your ideas to yourself.

McLindon: Yes, there were no advocates.

Yost: Were there critics? Erich Bloch obviously was supportive of you, but were there, within NSF, critics of making these changes?

McLindon: That he wanted?

Yost: Or that you wanted with IT.

McLindon: Not when he was there. No, they were all afraid of him, are you kidding?

(Laughs.) No, I didn't do much before because I, number one, was trying to get rid of the Honeywell, just getting things in shape. And two, there were no advocates. Dick Atkinson would have been an advocate, but he left as director, right after I came.

Yost: So things changed fundamentally, with Erich.

McLindon: Yes they did. And everybody knew he was serious, so there was no playing around with this. Got to get with the program, which if anything, put more pressure on me because that meant I had to help things move along and we always had email

problems. You know nothing was perfect in those days. I think Note was up by then, and it would go down periodically. The dependence on it was very high, so any downtime was very negative. I'd get screams and yells, so it was a lot nicer in the old days when nobody was doing any of that!

Yost: Are there questions that I haven't asked or topics I haven't addressed that would be useful?

McLindon: No, you've covered everything. (Laughs.) I think I'm not a helpful interviewee because I wasn't there much during the FastLane project and secondly, I don't remember a lot. So I hope I've been helpful.

Yost: Very much so. There's a level of detail that we got from Fred but we also need the higher level perspective on policy and that's really come across from you.

McLindon: One of my major responsibilities was getting information about emerging technology and getting buy in from industry organizations to interact with us as we moved forward. Finding out — with help from Fred and others — where the leaders in the technology world were; going out there; bending their arm a little; trying to get support. We got six, I think, computers from NeXT, on loan, or forever, I don't remember what. We were always trying out things and just leading that was fun.

Yost: Are there particular individuals who stand out, that you had contacts with, that really influenced your thinking about the IT infrastructure of NSF and more specifically, networking in FastLane?

McLindon: The people we interacted with were Steve Jobs, at Apple; Judy Estrin, who was at Bridge, and then she and her husband bought 3Com; and others. We talked to everybody. We were trying to find out how we could get the HPs to go TCP/IP, so we spent a lot of time with HP. But each of these things was contained, you know. Maybe an advisory group would say what you need to do is A to Z, but usually, most of the people we were talking to were focusing on their niche, which was normal. We had some good people inside and outside NSF who had a lot of good ideas. Tom Weber is a person who comes to mind. He was an IS division director in OIRM; which is interesting because he's a chemist. Smart person. He and Al Thaler, who I mentioned earlier, always were out there in the network, figuring out what's coming up next and would nudge me every once in a while saying you've really got to get moving on this. So it was that kind of thing.

Yost: Anyone else inside or outside NSF?

McLindon: I'm sure there were lots, but I'd have to think about that. I'll send you the names if I think of anybody else. Have you talked to Gerry Glaser?

Yost: No I haven't yet, but he's next on our list.

McLindon: How long do you have for this?

Yost: It's a three-year project.

McLindon: What year are you in? One?

Yost: We're at the end of Year One and we've done probably over half the interviews with users and we're in the first third of interviews with individuals at NSF. We'll also be interviewing the legacy users of NSF, the program managers, and collecting any documentation we can, as well. Oral history is one of our main methodologies but we're also working with the NSF historian to collect whatever documentation we can.

McLindon: Good. Are you enjoying this?

Yost: Yes. Thank you. (Interview concluded.)