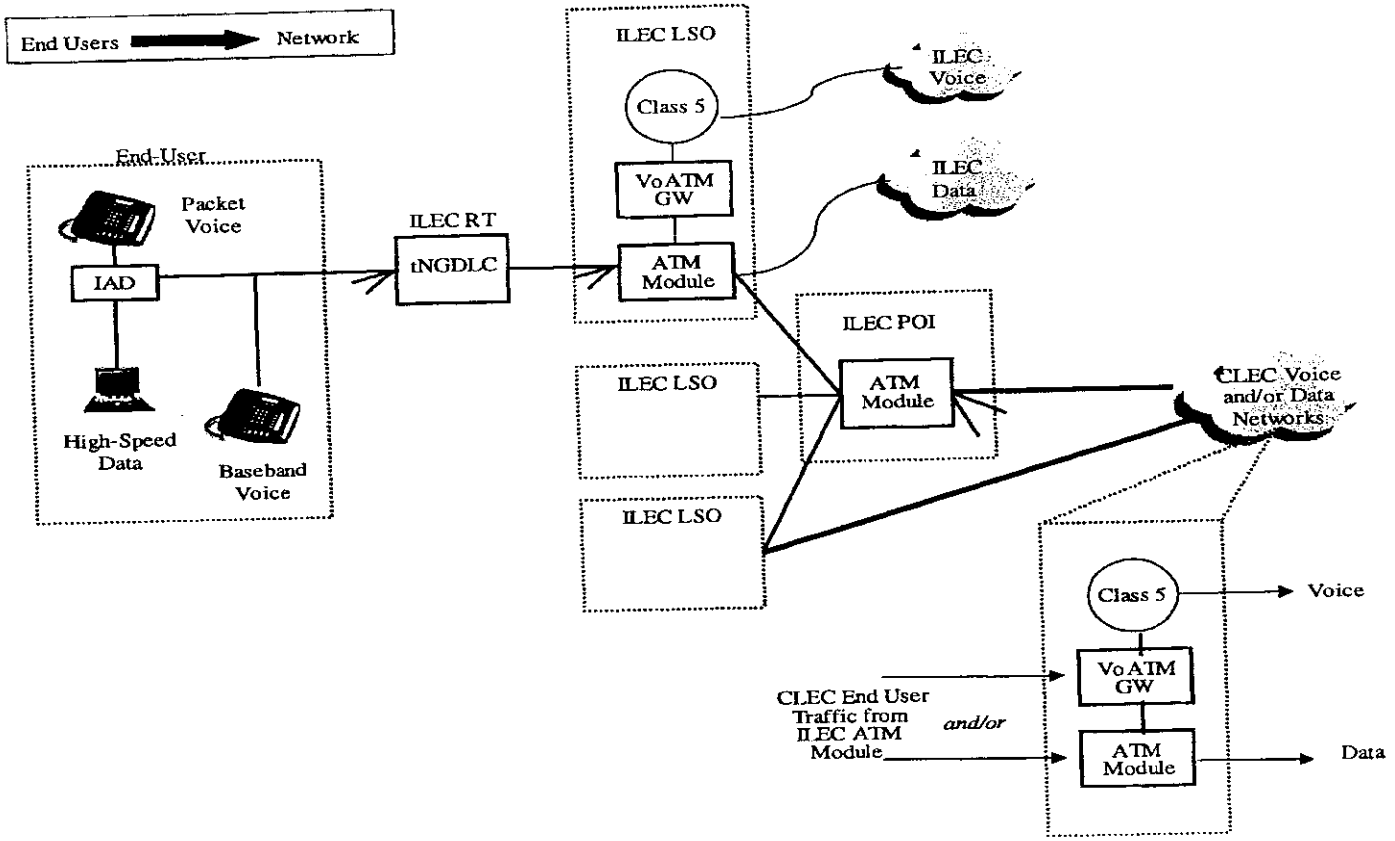
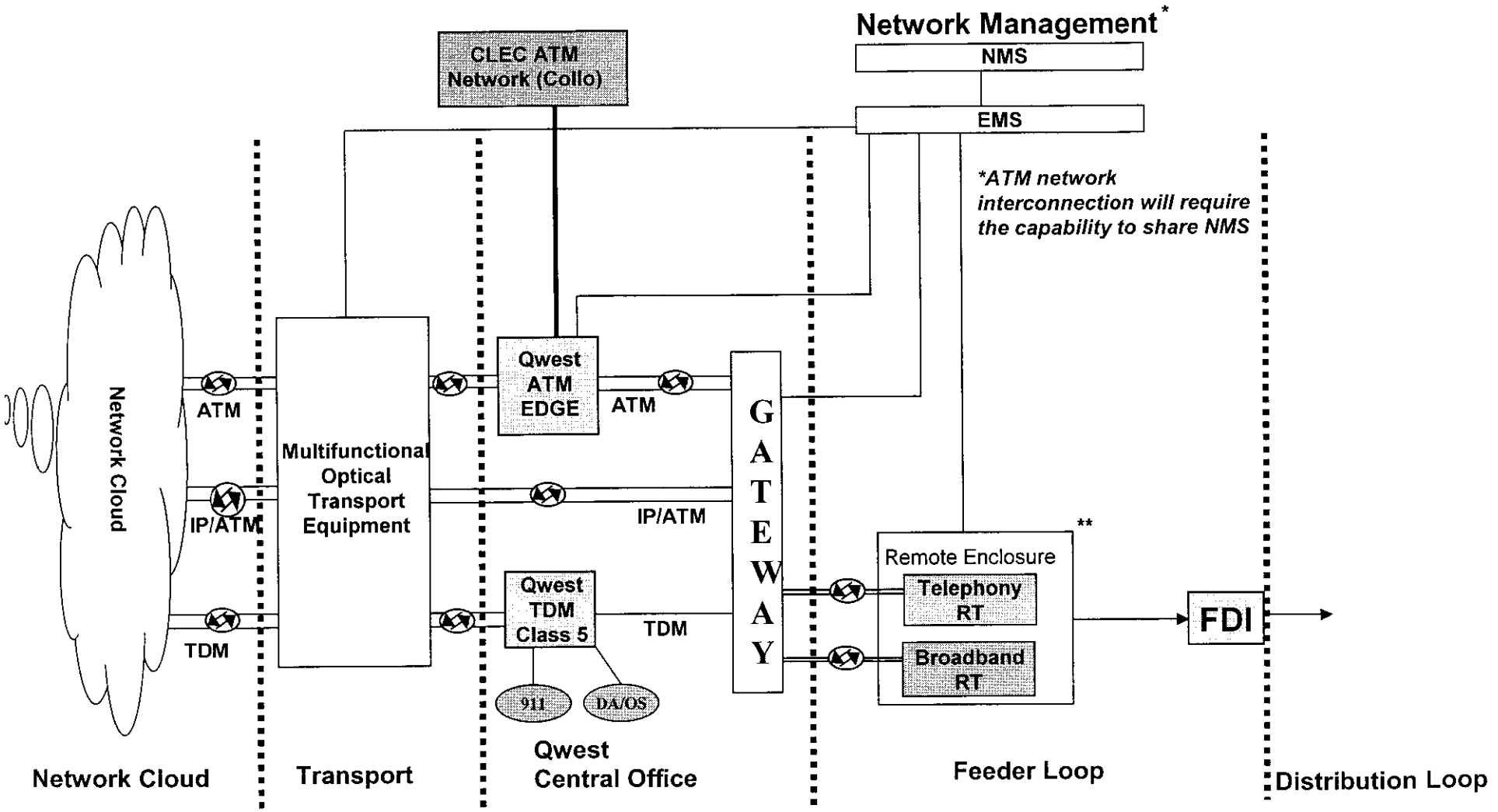
Electronic Loop Provisioning

Exhibit No. ___ (DP/LN-24)
Docket No. UT-033044
January 23, 2004

GENERAL ELP NETWORK ARCHITECTURE



The Full NGDLC Architecture



**NGDLC deployment would require physical separation of shelf and fiber transport for appropriate affiliate separation.

NOTE: Gateway is a functional description only for equipment that includes multi-protocol conversion

Summary of AT&T's Proposed ELP Architecture

- AT&T's Proposed ELP Architecture Does Not:
  - Identify the demand for a near 100% loop plant replacement
  - Consider requirements necessary to facilitate multi-provider interconnection
  - Account for Common Channel Signaling vendor interoperability
  - Address the provisioning of 911/E911 and PSAP services
  - Address the provisioning of DA/OS services
  - Address a method of Quality of Service (QoS) verification

Summary of AT&T's Proposed ELP Architecture (continued)

- AT&T's Proposed ELP Architecture also:
  - Limits LEC architecture
  - Stifles evolution
  - Requires replacement of functioning infrastructure
  - Proposes that ELP is analogous to the FGD (Equal Access) implementation, which minimizes the ELP technology change out

ELP Technical Limitations

- **Electronic Loop Provisioning (ELP)**
  - **ELP requires Voice over Asynchronous Transfer Mode (VoATM) packet architecture that does not currently exist in Qwest's network**
    - In order to provide ELP functionality and increase capacity, Qwest would have to extensively augment its existing network
      - Qwest's existing ATM switch technology does not have the capacity or capability to support ELP
      - Qwest would be required to deploy a new ATM infrastructure in every central office

ELP Technical Limitations (continued)

- **Electronic Loop Provisioning (ELP) (continued)**
  - **ELP requires an ATM packet protocol that is fundamentally different from Qwest's circuit based Time Division Multiplexing (TDM) network**
    - Qwest's existing voice DLC platform is circuit based TDM, while ELP is packet based
    - Qwest would be required to replace all existing circuit based TDM DLC equipment with an optical based ATM infrastructure that is ELP capable

ELP Technical Limitations (continued)

- **ATM to ATM Interconnection**
  - **An ELP architecture would require an ATM Inter-Networking Interface (A-INI) protocol; this type of protocol does not exist in Qwest's network today**
    - A-INI is an ATM protocol that allows multiple ATM networks to interconnect
    - The existing Qwest User to Network Interface (UNI) does not provide for ELP functionality
  - **A-INI is required to provide a firewall between networks**
    - Qwest's UNI interface does not provide the necessary firewall to interconnect multiple interconnecting ATM networks

ELP Technical Limitations (continued)

- **ATM to ATM interconnection (continued)**
  - **A-INI has not been fully developed or implemented by industry vendors**
    - Vendors of telecom equipment would be required to develop and implement A-INI
  - **ELP requires A-INI VoATM interconnection for the exchange of local traffic**
    - Minutes-of-use billing has only been developed for TDM networks
    - ELP would require vendors to develop the ability to bill ATM interconnection minutes of use

ELP Technical Limitations (continued)

- **Gateway Architecture**
  - **Telecom vendors would be required to develop gateways for multi-provider access**
    - Qwest's existing circuit based TDM technology allows interconnection for multiple carriers
    - Qwest has not deployed multi-protocol gateways that support ELP

ELP Technical Limitations (continued)

- **Element Management Systems (EMS) and Network Management Systems (NMS)**
  - **EMS and NMS have not been fully tested or deployed for multi-carrier access and interoperable environments**
    - Partitionable EMS would enable CLEC access to features, functions and capabilities
      - Vendors of telecom equipment and software would have to develop a proven partitionable EMS
    - Non-partitioned EMS systems adversely impact all users
      - Over provisioning of ATM network capacity will reduce interconnected carriers capability to provide service
      - Interconnecting carriers' alarm reporting could potentially flood a multi-provider ATM network

ELP Technical Limitations (continued)

- Element Management Systems (EMS) and Network Management Systems (NMS) (continued)
  - ELP would require VoATM Quality of Service (QoS) standards
  - QoS standards have been established for the circuit based TDM network, but not for VoATM

ELP Technical Limitations (continued)

- **Common Channel Signaling**
  - **ELP requires Bearer Independent Call Control (BICC) Protocol to establish virtual voice paths through the ATM network**
    - BICC Protocol has not been proven to be vendor interoperable in Qwest's network
    - Lab testing would have to prove vendor interoperability
    - Lab testing of vendor interoperability has not been completed

ELP Technical Limitations (continued)

- **911/E911 and Public Safety Answering Point (PSAP)**
  - **Qwest associated emergency services network is circuit based TDM, not packet based**
    - Currently PSAPs have not deployed packet based 911/E911 networks
- **Directory Assistance/Operator Service (DA/OS)**
  - **DA/OS networks are circuit based TDM, not packet based**
    - If ELP supports DA/OS, all DA/OS networks would need to be packet capable
      - Currently, OS/DA providers have not deployed packet based DA/OS networks

Impact Summary

- AT&T is searching the ILEC ATM network for additional network features beyond the FCC's requirements, expecting to create services based on network features that ILEC's have not deployed or do not use

Impact Summary
(continued)

- The FCC has ruled that Unbundled Packet Switching (UPS) is the only ATM packet switching UNE that passes the Act's necessary and impair test where:
  1. Qwest has deployed digital loop carrier systems, including but not limited to, integrated digital loop carrier (IDLC) or universal digital loop carrier systems or has deployed any other system in which fiber optic facilities replace copper facilities in the distribution section,
  2. There are no spare copper loops available capable of supporting the xDSL services the requesting carrier seeks to offer,
  3. Qwest has placed a DSLAM for its own use in a remote Qwest premises, but has not permitted CLEC to collocate its own DSLAM at the same remote Qwest premises,
  4. Qwest has deployed packet switching capability for its own use.

Impact Summary
(continued)

- ELP would require Qwest to provide unfettered access to UPS even where the FCC's four conditions have not been met
- AT&T's proposal for ELP and unconditional access to Qwest's network would permit AT&T to reassign its financial risk to Qwest
- AT&T's proposal creates an opportunity for CLECs to directly access NGDLC through virtual connections, which provides slamming opportunities that would impact customer choice

Impact Summary
(continued)

- In order for Qwest to provide ELP, as proposed by AT&T, Qwest would be required to make significant changes to its existing network; this type of sweeping technology change would require billions of new capital investment

- AT&T's arguments about GR-303 are largely irrelevant to the cost of deploying ELP
  - Only about 18% of Qwest's Central Offices are currently equipped with GR-303 capability
  - Only about 2% of Qwest's access lines are served by GR-303 DLC

Impact Summary (continued)

- ELP would require Qwest to place new A-INI capable ATM switches in every central office in its region
  - Currently, Qwest has 146 ATMs deployed in 12% of its central offices
  - Qwest's existing ATM technology does not have the capacity to support a robust ELP functionality
- Qwest's currently deployed ATM interfaces do not support ELP
  - All existing ATM interfaces would require A-INI, rather than the UNI interface that Qwest currently has in place
  - Additional hardware would be required to upgrade Qwest's existing ATM network to be A-INI capable

Impact Summary (continued)

- The FGD transition did not demand the degree of global infrastructure replacement, and was based on exiting, prevalent capabilities
  - The FGD (Equal Access), MFJ driven transition, adjusted the in-place architecture; it was essentially software based
  - It did not demand technology replacement
  - In fact, it was not nearly as equipment focused as the ELP thought
  - Some new signaling enhancements were needed for exiting switches for FGD (Equal Access), not global infrastructure replacement

FGD (Equal Access) vs ELP
High Level Comparison

☐ FGD

- **Existing Switching architecture left in place**
  - OSS change was required
- **Billing System architecture left in place**
  - Enhancements required
- **Software development lengthened process completion (biggest obstacle)**

☐ ELP

- **All new ATM infrastructure in every central office**
- **Replace all existing circuit based TDM DLC equipment**
- **With an optical based ATM infrastructure**
- **That is ELP capable**
- **An ELP architecture would require an A-INI protocol; this type of protocol does not exist in Qwest's network today**

Conclusion

- **AT&T (by recommending ELP) is trying to solve a hot-cut problem that does not exist and has a hidden agenda to require ILEC's to replace their functioning infrastructure with a next generation network**
  - **Qwest's current hot-cut performance is meeting or exceeding current performance standards**
    - In particular, in each month since July of 2001, Qwest has performed at least 98% of its analog loop hot-cuts on time and at least 96% of its digital loop hot-cuts on time

Conclusion
(continued)

☐ Qwest's current hot-cut performance (continued)

- Furthermore, as demonstrated in the *UNE Fact Report*, hot-cuts are now routinely completed on-time without significant disruptions more than 98% of the time. [1]
- Because they cannot credibly dispute the overwhelming evidence of the ready availability of switching from sources other than ILECs, AT&T falls back to the argument that "hot cuts" pose operational impediments sufficient to satisfy the impair standard. But AT&T ignores the evidence that hot cut performance has improved considerably in the more than two years since the *UNE Remand Order* to a level foreclosing any argument that hot cuts pose an operational or other barrier to competition through use of UNE loops.

1 UNE Fact Report at II - 16 to II - 17, App. H.

Final Thoughts

- It seems hard to imagine that the FCC or any state commission could take the ELP proposal seriously when one of their charters is to keep dial tone costs to customers as reasonable as possible. If it is as cost-effective as AT&T promotes, any army of CLECs would be rushing in to place NGDLCs at the FDI and cut the ILEC out of a major segment of the business, leveraging off unbundled subloops
- If this thrust were successful, an architecture du joir is mandated to the service provider
- Is this something that AT&T is offering on their own ATM network?

Acronyms

- **A-INI:** ATM INTERNETWORK INTERFACE
- **ATM:** ASYNCHRONOUS TRANSFER MODE
- **BICC:** BEARER INDEPENDENT CALL CONTROL
- **CLEC:** COMPETITIVE LOCAL EXCHANGE CARRIER
- **CO:** CENTRAL OFFICE
- **DA:** DIRECTORY ASSISTANCE
- **DSLAM :** DIGITAL SUBSCRIBER LINE ACCESS MULTIPLEXER
- **ELP:** ELECTRONIC LOOP PROVISIONING
- **EMS:** ELEMENT MANAGEMENT SYSTEM
- **FCC:** FEDERAL COMMUNICATIONS COMMISSION
- **FDI:** FEEDER/DISTRIBUTION INTERFACE
- **FGD:** FEATURE GROUP D
- **IDLC:** INTEGRATED DIGITAL LOOP CARRIER
- **ILEC:** INCUMBENT LOCAL EXCHANGE CARRIER
- **IP:** INTERNET PROTOCOL
- **NE:** NETWORK ELEMENT
- **NGDLC:** NEXT GENERATION DIGITAL LOOP CARRIER
- **NMS:** NETWORK MANAGEMENT SYSTEM
- **OS:** OPERATOR SERVICES
- **PSAP:** PUBLIC SAFETY ANSWERING POINT
- **QoS:** QUALITY OF SERVICE
- **RT:** REMOTE TERMINAL
- **TDM:** TIME DIVISION MULTIPLEXING
- **UNI:** USER NETWORK INTERFACE
- **UPS:** UNBUNDLED PACKET SWITCHING