

Ascend

Customer Network Management (CNM) Services for Service Providers

**Offering CNM Services
for Ascend IP, Frame Relay,
and ATM Wide Area Networks**



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Product Marketing Manager**





CNM is a Market Imperative

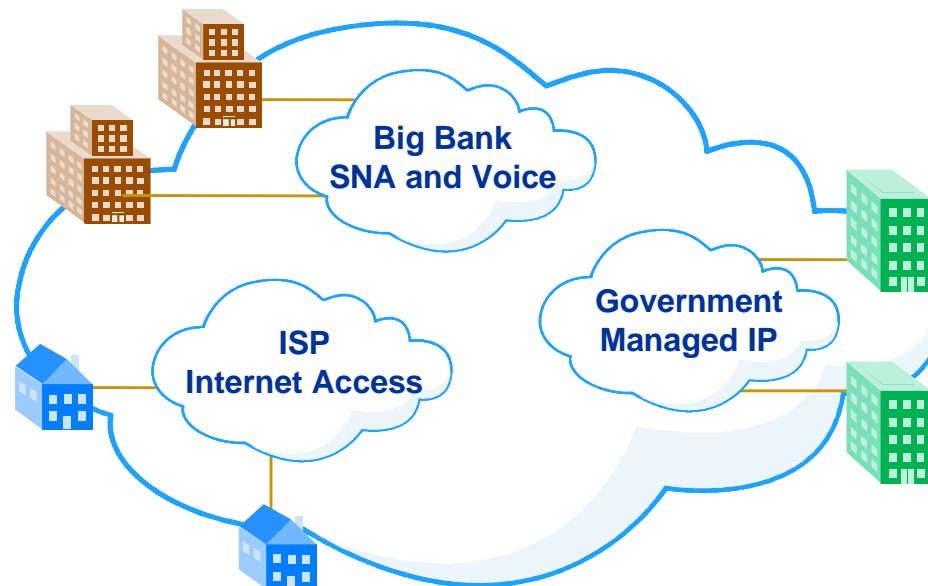
- **CNM enables private views into public networks**
 - ◆ RFP requirement from end-user to enable outsourcing
 - ◆ Increases service provider credibility by verifying network operations
- **CNM is a competitive differentiator**
 - ◆ Increases customer retention and loyalty
- **CNM brings a business model to network management**
 - ◆ New revenue opportunities with levels of offerings
 - ◆ New marketing opportunities: branding
- **Wholesaling enabler**
 - ◆ Delivers carrier of carrier model



What the Customer Wants

Enterprises will employ public data delivery if:

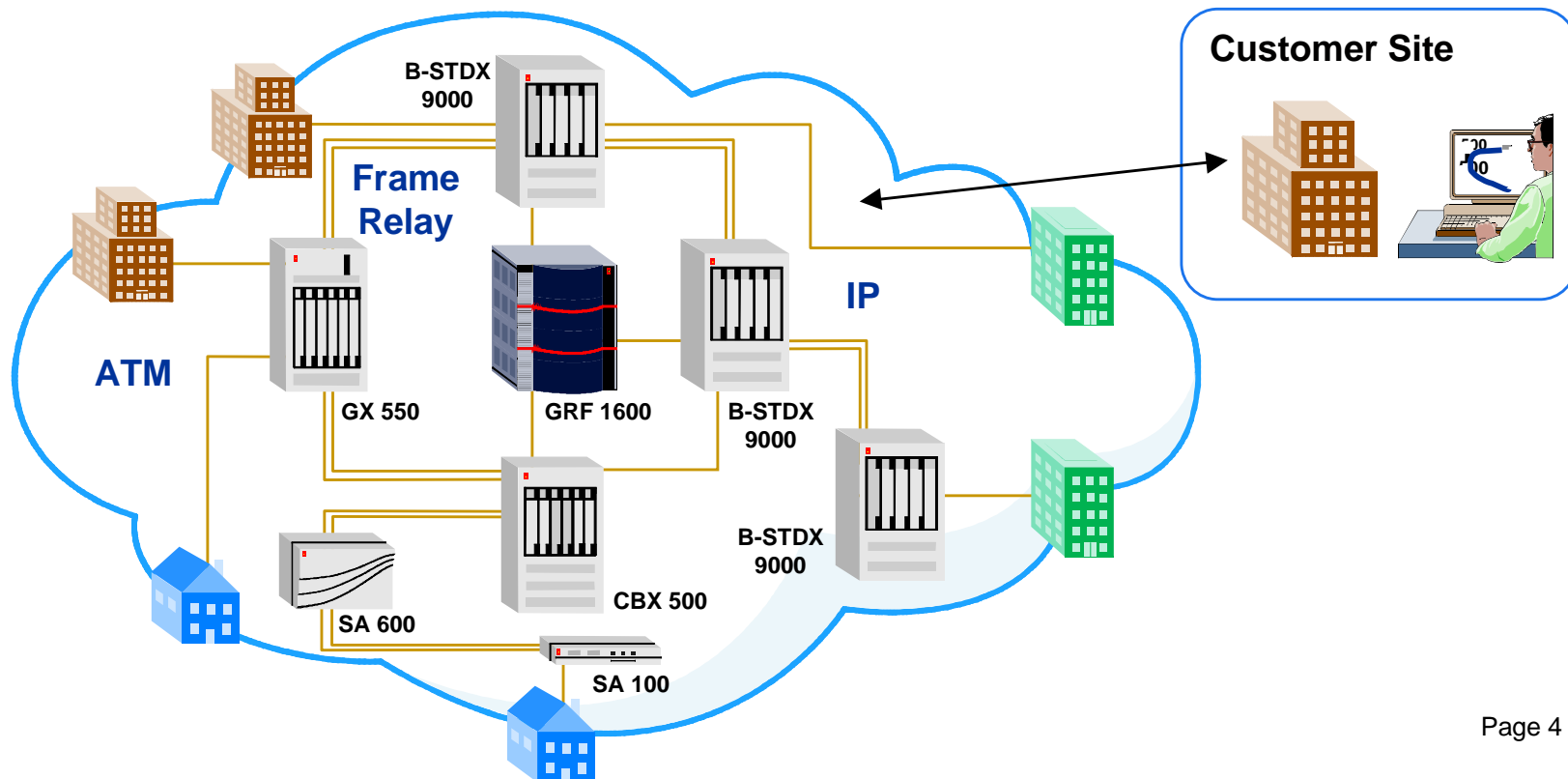
- ◆ A service portfolio is offered that addresses their traffic profiles, business operations and cost points
- ◆ IS managers can maintain a degree of control
- ◆ Traffic transport and management access are secure





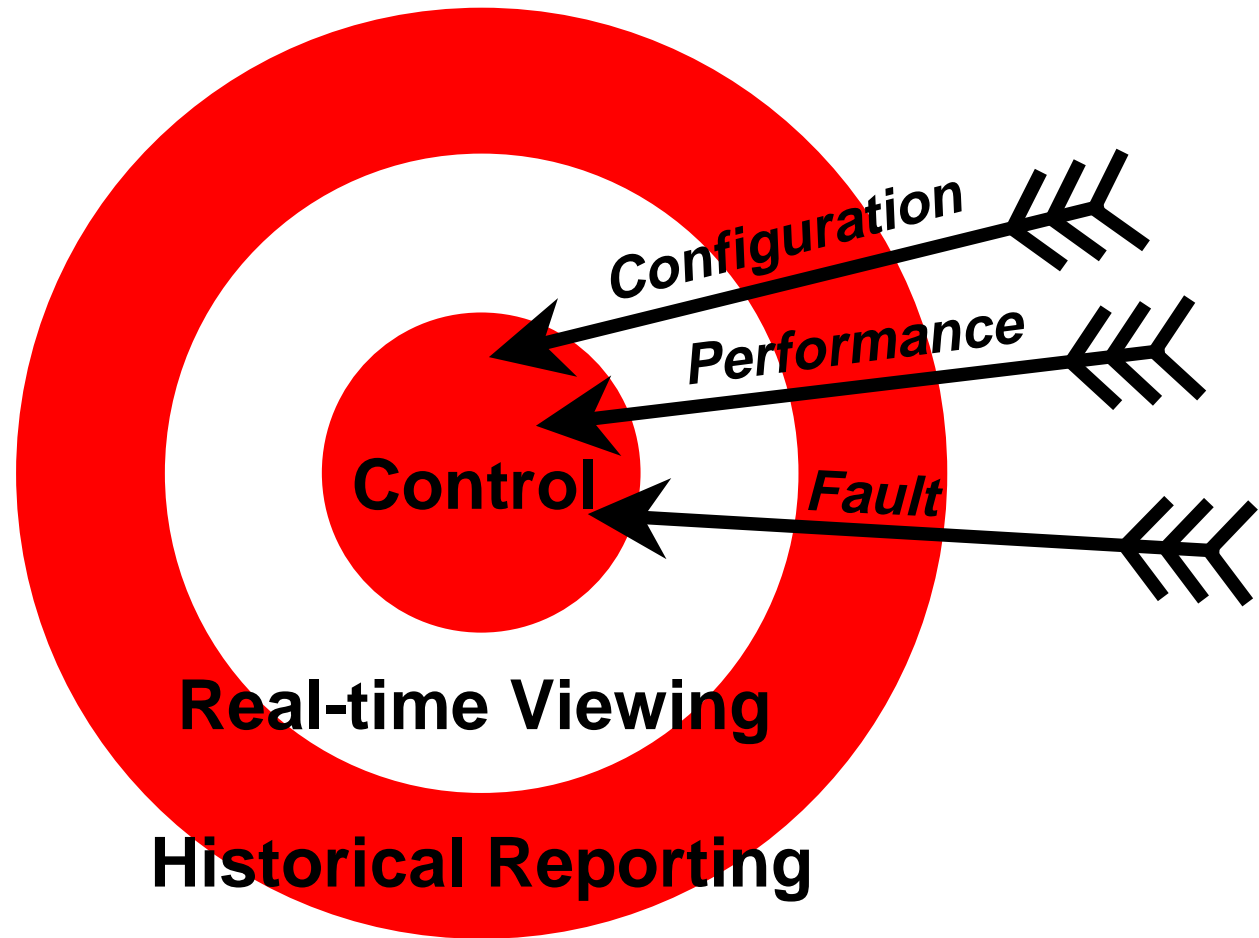
What is CNM?

- CNM gives service provider customers access to information about their portion of the network
- CNM delivers private-level views and control over the public infrastructure





CNM Service Targets





Meeting the CNM Challenge

Ascend's CSD CNM Offerings

Ascend CSD Products

NEW!

- NavisXtend™ CNM Gateway
- NavisXtend Provisioning Server
- NavisXtend Fault Server
- NavisXtend CNM Server
- NavisXtend Statistics Server
- NavisXtend Report Generator
- NavisXtend SLA Reports

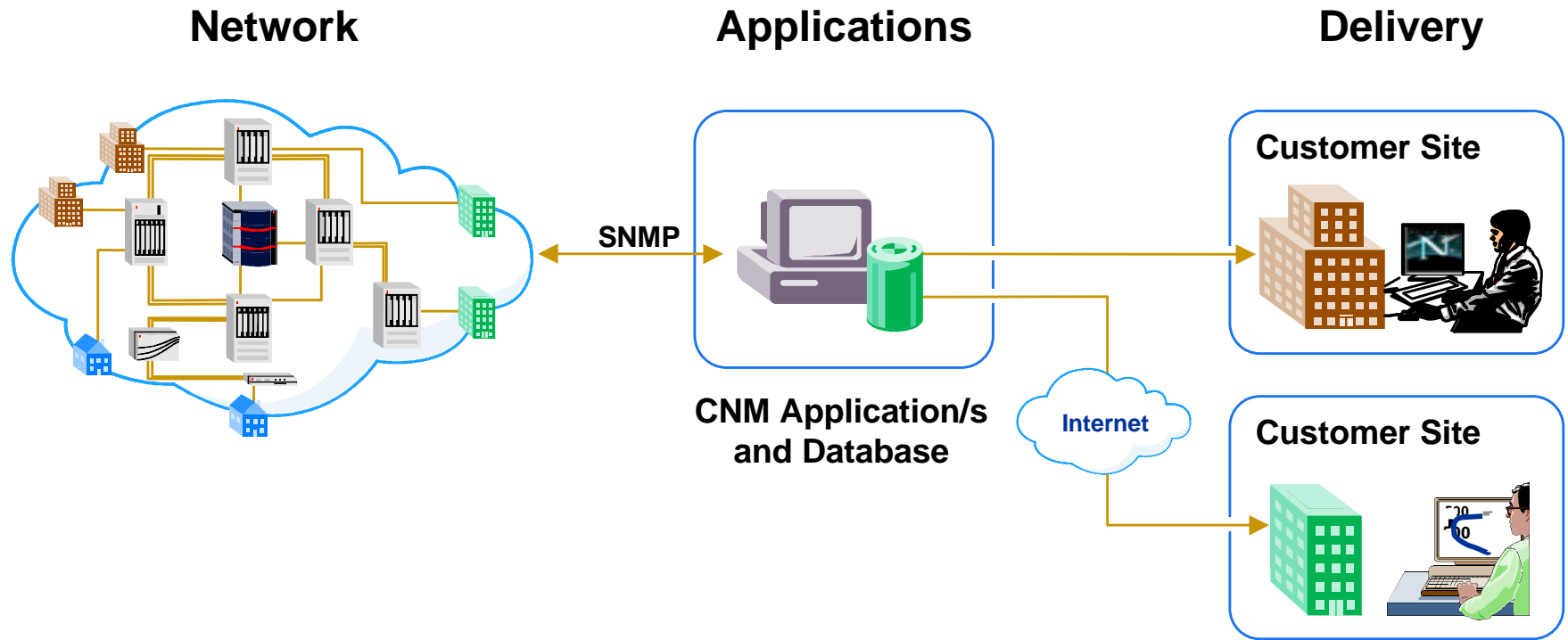
NEW!

CNM Services Enabled

- **Historical Reporting**
 - ◆ Configuration information
 - ◆ Fault trending
 - ◆ Network utilization
 - ◆ Network delay
 - ◆ Network throughput
- **Real time Viewing**
 - ◆ Network statistics
 - ◆ Current faults
- **Control**
 - ◆ Provisioning parameters
 - ◆ Report scheduling
 - ◆ Diagnostic testing



NavisXtend CNM Gateway



■ CNM Gateway:

- ◆ Package network information into CNM service levels
- ◆ Control CNM service access by customer
- ◆ Authenticate customer access and secure delivery



NavisXtend CNM Gateway Example Session

Customer Logs in via Netscape SSL

A screenshot of a Netscape browser window displaying a Java applet titled "Login Window". The applet has a title bar with standard window controls. The main content area is divided into two sections. The left section, titled "CNM LOGIN SCREEN", contains a form with the following fields: "Customer ID:" with a text box containing "Universal Bank", "User ID:" with an empty text box, "Password:" with an empty text box, and "Mapping Option:" with two radio buttons, "Tabular" (selected) and "Graphical". Below these are "Login" and "Exit" buttons. The right section features a large graphic of the Ascend logo (a red triangle with a yellow circle inside) and the word "ASCEND" in red capital letters below it. The status bar at the bottom of the window reads "Unsigned Java Applet Window".



NavisXtend CNM Gateway Example Session

Customer selects network, lport or circuit to examine
(based on the subset that applies only to this login)

The screenshot displays three overlapping windows from the NavisXtend CNM Gateway application, all featuring the Ascend logo and a menu bar with File, Config Mgmt, Fault Mgmt, Reporting, Monitoring, User Prefs, and Help.

Virtual Private Network Window: Shows a table with VPN locations and their associated LPorts.

VPN Location	#LPorts	#LPorts
Adnet-500-1	3	3
Adnet-500-2	7	7
Adnet-9000-1	4	3

Below the table is a "Locate City:" field.

LPort Information Window: Displays the title "LPort Information" and the Ascend logo.

Circuit Information Window: Shows "Source Location: Adnet-500-1" and "LP End Point1: n1s14p3-oc3-uni-radcom". It contains a table with circuit details.

Circuit Name	Destination	LP End Point2	Admin Status	Oper Status
n1s14p3-oc3-uni-radcom-n2s6p3-oc	Adnet-500-2	n2s6p3-oc3-uni-ra	Up	Down
500to500ckt2	Adnet-500-1	n1s14p3-oc3-uni-r	Up	Down

Below the table are fields for "Locate Circuit:" and "View Circuits:" with radio buttons for "All Circuits" (selected) and "Down Circuits".



NavisXtend CNM Gateway Example Session

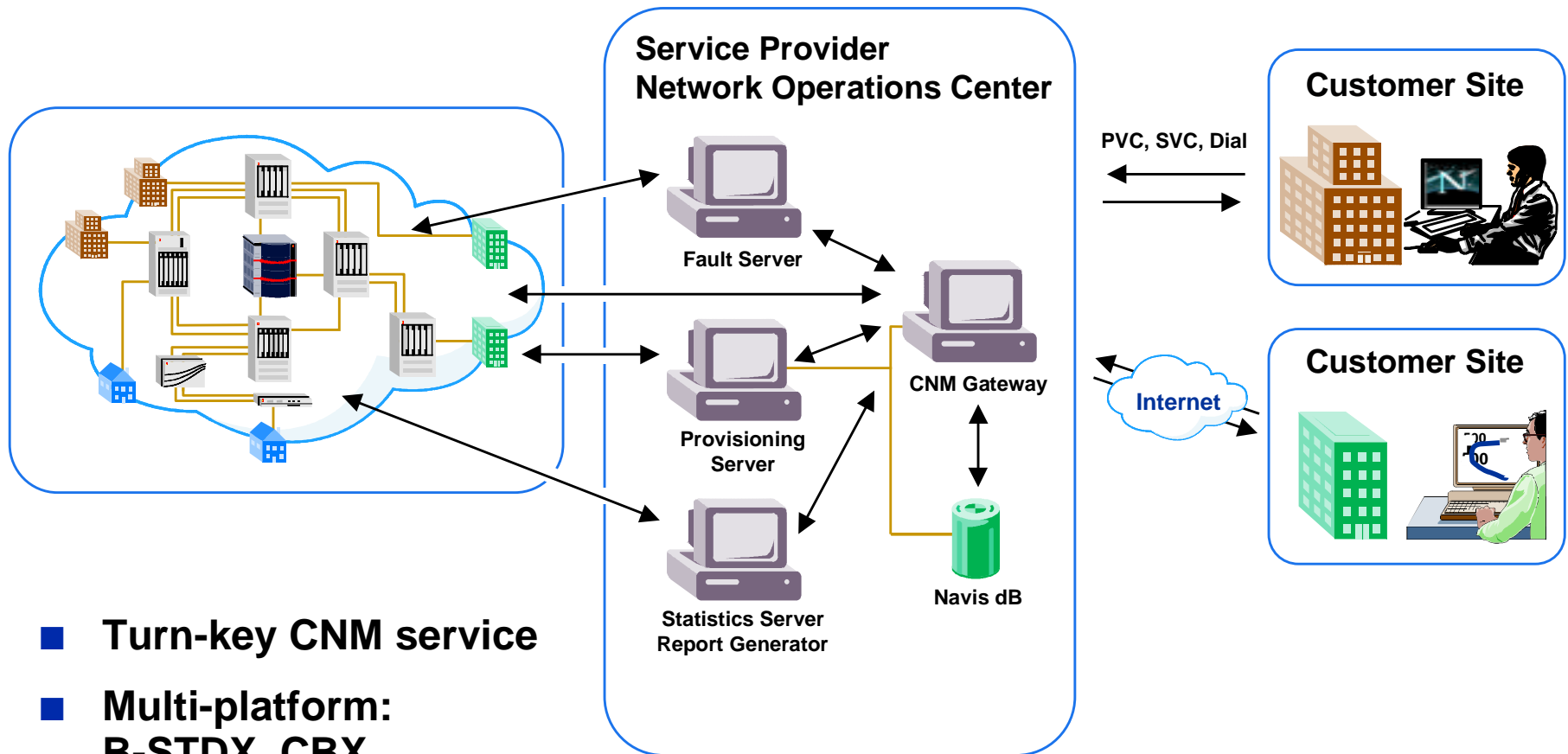
Customer can view or control configurations, view alarms, start loopbacks, examine statistics, etc.

The screenshot displays four overlapping windows from the NavisXtend CNM Gateway interface:

- Alarm Window:** Shows "Alarm Information" for Circuit Name: n1s14p3-oc3-uni-radcom-n2s8. It includes a table with columns: Alarm, Time Stamp, and Severity.
- LPort Summary Monitoring:** Displays "LPort Summary Statistics" for LPort Name: n1s14p3-oc3-uni-radcom. It includes a "Cumulative Statistics" table with columns: Received, Transmitted, Received, and Transmitted. The "Number of Cells" is 0. The "Refresh Time" is 06-Jan-98 2:00:28 PM.
- Modify Circuit:** Shows configuration for Circuit Name: n1s14p3-oc3-uni-radcom-n2s8p3-oc3-uni-PVC. It includes fields for Admin Status (Up), Oper Status (Down), LP End Point 1, LP End Point 2, LP Port Name, LP Port Type, VPI, VCI, Forward/Reverse direction, and various counters (SCR, MRS, PCR) for each direction.
- Circuit Loopback Test:** Shows configuration for Circuit Name: n1s14p3-oc3-uni-radcom-n2s8p3-oc3-uni-PVC. It includes fields for Admin Status (Up), Oper Status (Down), LP End Point 1, LP End Point 2, LP Port Name, LP Port Type, VPI, VCI, and Loopback Type (Disabled).



NavisXtend CNM Gateway Operation



- **Turn-key CNM service**
- **Multi-platform: B-STDX, CBX**
- **Multiservice: Frame Relay, ATM**



CNM Service Examples

CNM Service Name	Configuration Access	Real-time Monitoring Access	Performance Report Access	Fault Management	Circuit Modify Access
Premium CNM Service 1	Y	Y	Y	Y	Y
Standard CNM Service 1	Y	Y	Y	Y	N
Standard CNM Service 2	Y	Y	Y	N	N
Basic CNM Service	Y	N	Y	N	N

Customer ID	Customer Name	CNM Service Type
BK-97-0010	Bank A	Premium CNM Service 1
BK-97-1927	Bank B	Standard CNM Service 1
ZF-97-2928	Dept. of Motor Vehicles	Basic CNM Service
RR-97-0832	Railroads Utility	Standard CNM Service 2

Flexible service creation to meet different market needs



CNM Gateway Options

■ Configuration

- ◆ View Iport configuration
- ◆ View PVC configuration
- ◆ Change admin state of PVC
- ◆ Add/Modify/Delete PVC to an Iport
- ◆ Frame Relay and ATM

■ Real-time Monitoring

- ◆ Lport or PVC name
- ◆ Admin & Operational status
- ◆ FR counts for: octet, packet discards, error packets
- ◆ ATM counts for cell ingress and egress, QoS parameters

■ Reporting

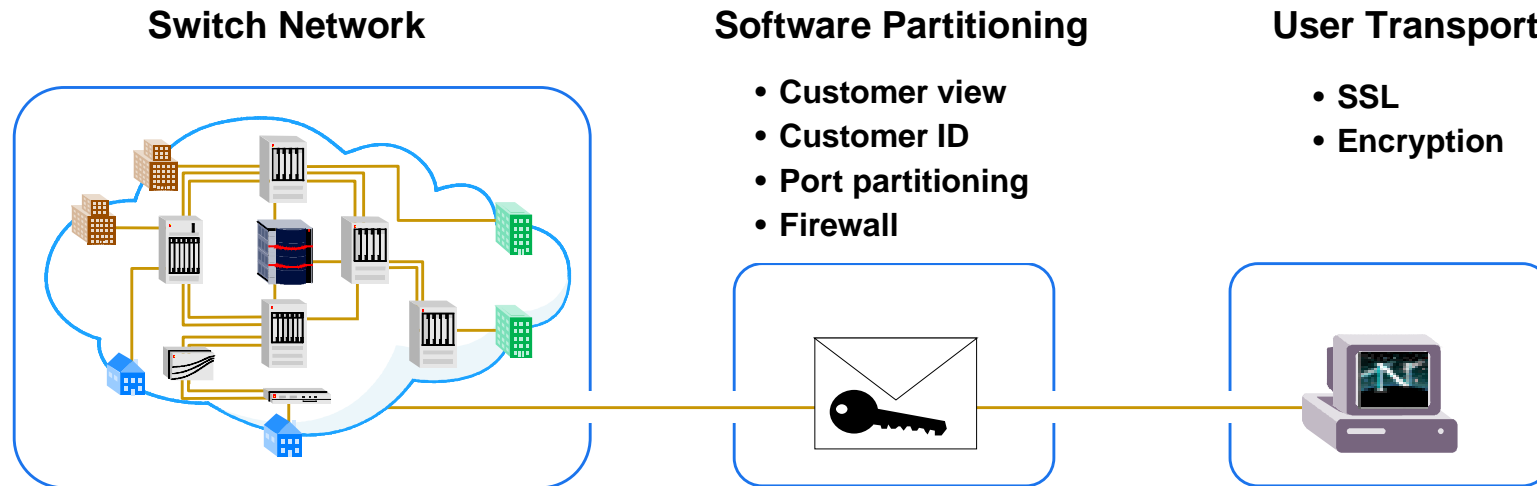
- ◆ Iport and PVC graphs and reports
- ◆ FR: Iport and PVC utilization and summary
- ◆ ATM: Iport and PVC utilization and summary
- ◆ FR: SLA reports

■ Fault Management

- ◆ View traps
- ◆ Loopback test: Iport or PVC



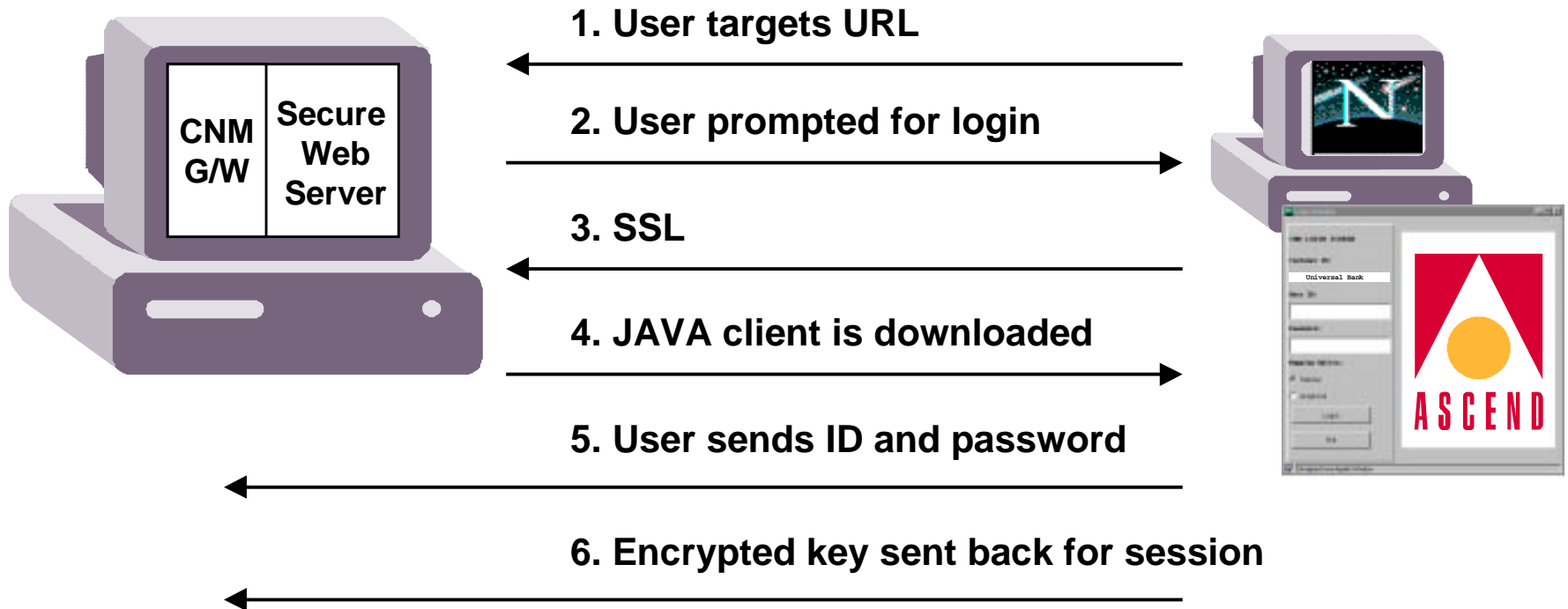
Multi-Level Security



- **Switch partitioning: VPN, customer ID, lport or pport**
- **Application level**
 - ◆ Authorization: customer IDs tied to privilege settings
 - ◆ Authentication: customer access restriction via customer ID (circuits) and CNM Gateway ID (multiple per customer)
 - ◆ User audit trails
- **Delivery transport**
 - ◆ Login to HTTP secure server
 - ◆ Encryption between CNM client and CNM Gateway



CNM Gateway Security Process



- No users can access the CNM Gateway application until the SSL is established with the Web server
- The entire CNM session is encrypted with a one-time key



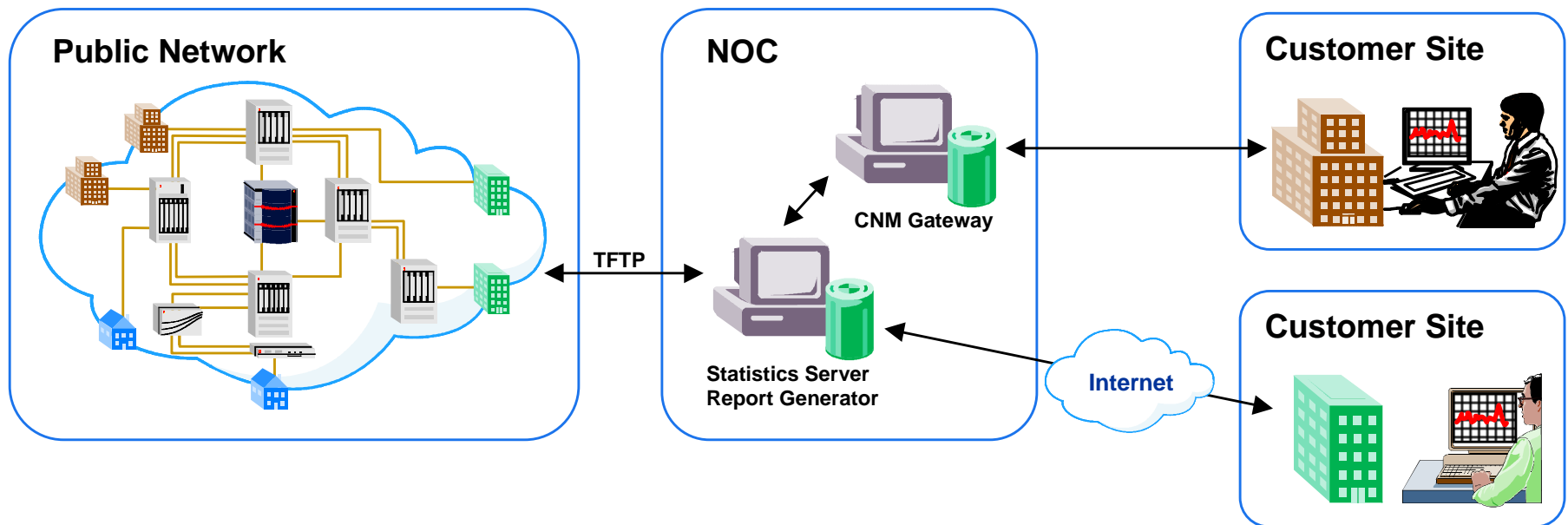
CNM Deployment Issues Answered

- Relevant network information is gathered for performance scalability
- CNM services can be flexibly packaged for competitive service deployment
- Access to and delivery of information is secure

NavisXtend CNM Gateway is a turn-key, scalable, cost-effective CNM solution, ready for service roll-out



NavisXtend Reports for CNM



- Reports on network utilization and SLA metrics
- Information dispersed to internal employees: account managers, network engineers, business managers and external customers
- Web-based access



Utilization Reporting



■ Network utilization reports

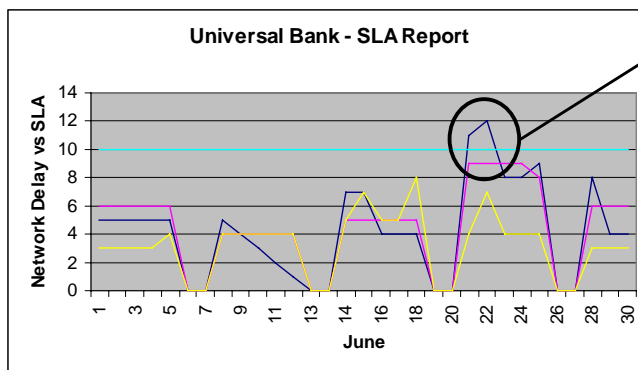
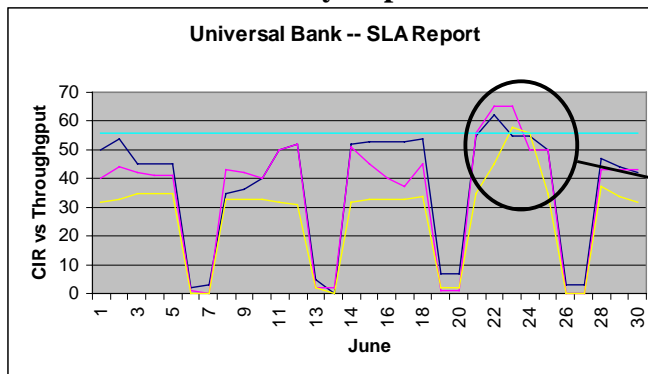
- ◆ Reports for ATM, Frame Relay, SMDS, PVC and SVC
- ◆ Data in octets and frames, displayed in tables and graphs
- ◆ Show data by day, week, month



Example SLA Session

Summary Report

Universal Bank SLA Summary Report: June

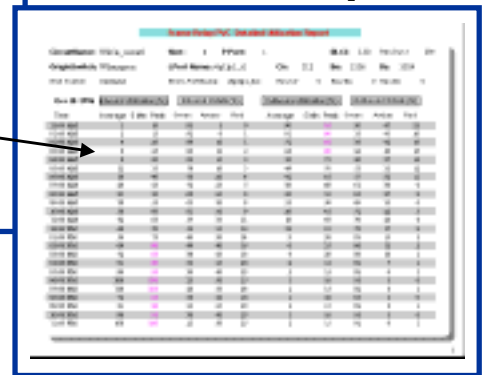


Exception Report

Universal Bank SLA Exceptions -- June

Date	PVC #	Location	Parameter
21-Jun	1	NYC - Los Angeles	Delay
21-Jun	1	NYC - Los Angeles	Delay
22-Jun	1	NYC - Los Angeles	Throughput
22-Jun	2	NYC - Boston	Throughput
23-Jun	2	NYC - Boston	Throughput
23-Jun	3	Boston - Los Angeles	Throughput

Detailed Report



- Customer sees at a glance if SLAs are met
- Drill down reports provide more details on problems

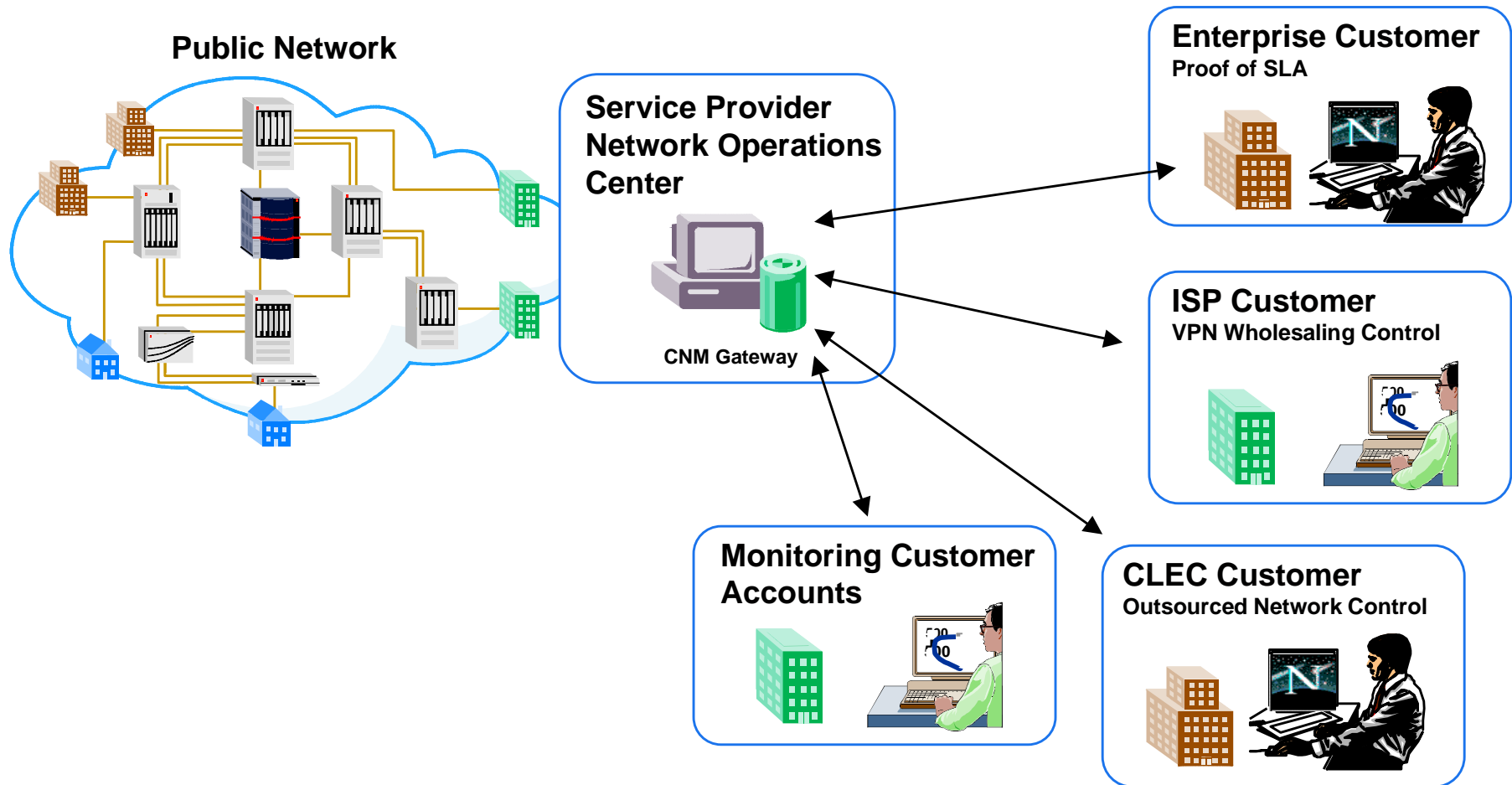


NavisXtend SLA Reporting

- **NavisXtend Report Generator SLA set for Frame Relay**
- **Statistical information is collected from the B-STDx and correlated by NavisXtend Statistics Server**
- **SLA – Network Throughput**
 - ◆ Complete data is collected (input, output and loss data for all types of QoS) over 20 data points for each network interface; input, output, errors by frame and octets, congestion indications.
- **SLA – Network Delay**
 - ◆ Delay is calculated every second on each PVC through “hello” packets. Switches store running min/avg/max counts.



CNM Service Examples



One infrastructure, multiple services



Customer Network Management Summary

- **CNM services gives service providers opportunities to**
 - ◆ Increase customer satisfaction
 - ◆ Raise retention levels
 - ◆ Generate new revenues
- **Ascend offers a host of CNM solutions, from turn-key systems to individual components**
 - ◆ CNM Gateway delivers comprehensive CNM services to end-users, with tight secure control
 - ◆ SLA Reports deliver proof of quality network services
- **CNM enables new services and meets the information demands of internal employees and external customers**