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Security for the Evolving Telecommunications Infrastructure

John Kimmins

Senior Director

(732) 758-2035

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Objectives

- Current threat environment

- Network functional components

- Security issues

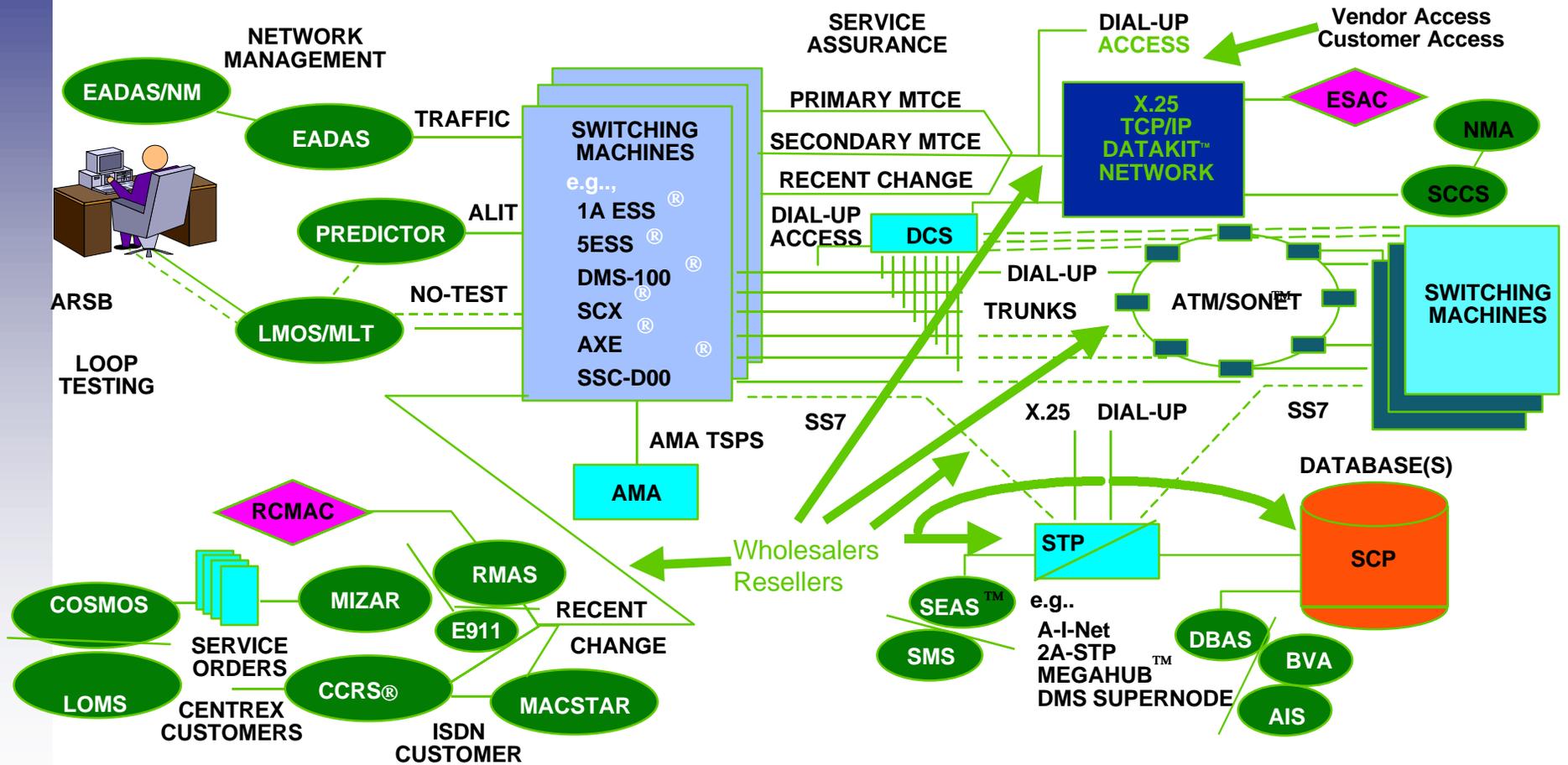- Government & Industry response

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Current Threat Environment

- Loose federations of intruders

- Domestic and international sources

- Insiders and outsiders

- New and old targets

- Some local outages

- New mindset - may create denials of service

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Current threat environment

- Dial-ins, data communications connectivity and Internet access exploitations to get to critical components

- Basic and sophisticated techniques

- Mobile systems & wireless access used

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PSN Environment: Old & New Targets

NETWORK MANAGEMENT

SERVICE ASSURANCE

DIAL-UP ACCESS

Vendor Access
Customer Access

EADAS/NM

EADAS

TRAFFIC

PRIMARY MTCE

SECONDARY MTCE

RECENT CHANGE

DIAL-UP ACCESS

X.25
TCP/IP
DATAKIT™
NETWORK

ESAC

NMA

SCCS

SWITCHING MACHINES

e.g..,
1A ESS ®
5ESS ®
DMS-100 ®
SCX
AXE ®
SSC-D00

PREDICTOR

ALIT

NO-TEST

LMOS/MLT

DCS

DIAL-UP

TRUNKS

ATM/SONET™

SWITCHING MACHINES

ARSB

LOOP TESTING

SS7

AMA TSPS

X.25   DIAL-UP

SS7

AMA

DATABASE(S)

RCMAC

RMAS

Wholesalers
Resellers

STP

SCP

COSMOS

MIZAR

E911

RECENT CHANGE

SEAS™

SMS

e.g..
A-I-Net
2A-STP
MEGAHUB™
DMS SUPERNODE

DBAS

BVA

AIS

SERVICE ORDERS

CCRS®

MACSTAR

LOMS

CENTREX CUSTOMERS

ISDN CUSTOMER

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Network Functional Components

- Local loop

- Switching

- Signaling

- Transmission facilities

- Operations

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Functional Components: Criticality Assessment

- Impact on call/connection processing

- Cross component effects

- Number of users affected

- Operations impact

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Major Security Issues
Examples

- Outsourcing of NE software development

- Outsourcing of network operations

- Vendor remote access

- Insertion of new technology NEs

- Open access to signaling/NEs/Operations

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Evolution of Network Domains within Service Providers

PSN

Corporate
DCNS

ISP Systems
& Support

Internet

New
Technology
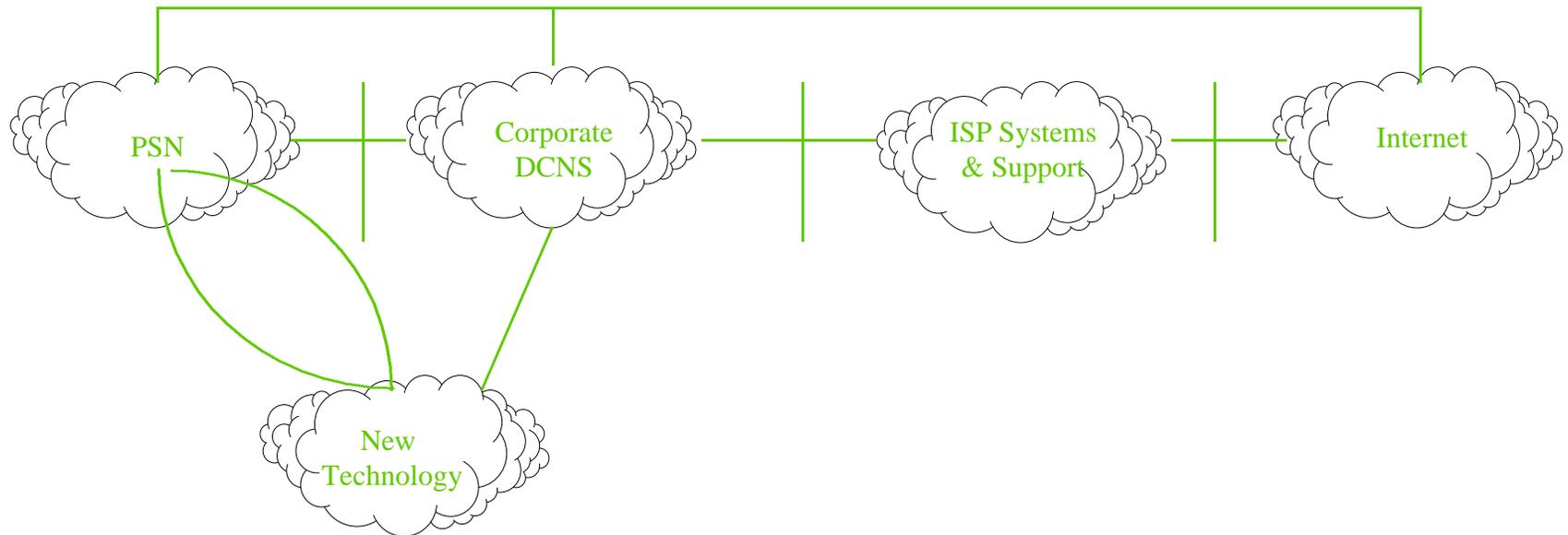
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Old/New technology Products: Evolution of Security Features

Feature Reqs. as per Bellcore Requirements	Traditional Network Elements		New Technology Network Elements	
	1990	Now	Now	Future
Individual Logins	M	H	L	?
Password Complexity	M	H	L	?
Password Aging & User Updating	L	H	N	?
Warning Banner	N	H	N	?
Login Bypass Restriction	M	H	N	?
Embedded Operations Access	NA	NA	L	?
Protocol Access Restrictions	NA	NA	N	?
Security Alarms	H	H	N	?
Timeout	H	H	M	?
Resource Access Privilege	H	H	L	?
Security Log	M	H	N	?
Security Admin Facilities	H	H	L	?
EMS Security	NA	NA	L	?
NMS Security	NA	NA	M	?
Physical Security	H	M	L	?

Note:
EMS=Element Mgt.. System
H=High
L=Low
M=Medium
NA=Not Applicable
NMS=Network Mgt.... System

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Industry/Government Response Examples

- National Security Information Exchange

- President's Commission on Critical Infrastructure Protection

- National Reliability & Interoperability Council

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Industry Security Thrusts Examples

- Enhancing signaling protocols

- Developing TMN security architecture

- Evolving security requirements

- Using user security tokens

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