

# The Growing Value of Cabling Systems

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# Preview

- Growing capabilities of structured cabling
- Investing in structured cabling
- Collecting and using data from multiple sources
- Getting the best return on that investment
- Use Case at Wake Forest University

# Trivia Question

- What is the significance of  
340,282,366,920,938,463,463,374,607,  
431,768,211,456
  - 340 undecillion, 282 decillion, 366 nonillion, 920 octillion, 938 septillion, 463 sextillion, 463 quintillion, 374 quadrillion, 607 trillion, 431 billion, 768 million, 211 thousand and 456

# Answer

- Two to the 128<sup>th</sup> power ( $2^{128}$ )
- 128-bit number with over 340 undecillion unique numbers

# So what?

- Version 6 of Internet Protocol (IPv6) uses a 128-bit address for IP devices
  - Over 340 undecillion possible IP device addresses
  - IPv4, has (“only”) about 4.2 billion unique IP addresses

# Driving Forces

- IP Technology is Exploding
  - Cheaper and Smaller Devices Creating Data
    - IPv6 has 665,570,793,348,866,943,898,599 unique addresses for every square meter on Earth
  - Memory is Cheap and Getting Cheaper

# Consequences

- Data is Proliferating
- Digital solutions to traditional analog systems
  - Telephony → VOIP
  - Building Automation Systems → IP-based I/O devices and sensors
  - Broadband Security → digital video/audio & storage
  - RFID → asset and personal safety

# Growing Capabilities

- More devices and thus more systems can use data cabling
- More traffic from more sources traveling on IP-capable Cabling
  - **YOUR cabling!**

AMP NETCONNECT CABLE



# Cabling Investment

- Growing Capabilities & Growing Demand
- Growing Value & Investment Opportunity

# Cabling Investment

- Data Cabling becomes IP cabling
  - A foundation for multiple systems
  - A way to save money
    - IP-based systems typically cost less
    - Costs of disparate or “one-off” systems prohibitive

# Cabling Investment

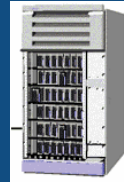
- “Companies that choose one-off solutions to each regulatory challenge they face will spend 10 times more on compliance projects than their counterparts that take a proactive approach.”
  - Source: Gartner Group, 11/04

# Multiple Systems

Digital Video



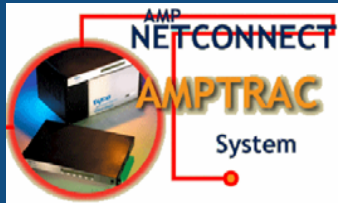
Database Storage



Facility Management  
IT Support Staff



Infrastructure  
Management



ERP



RFID



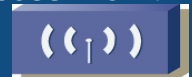
Logical Identity & Access Management



Physical Access System



Access Point



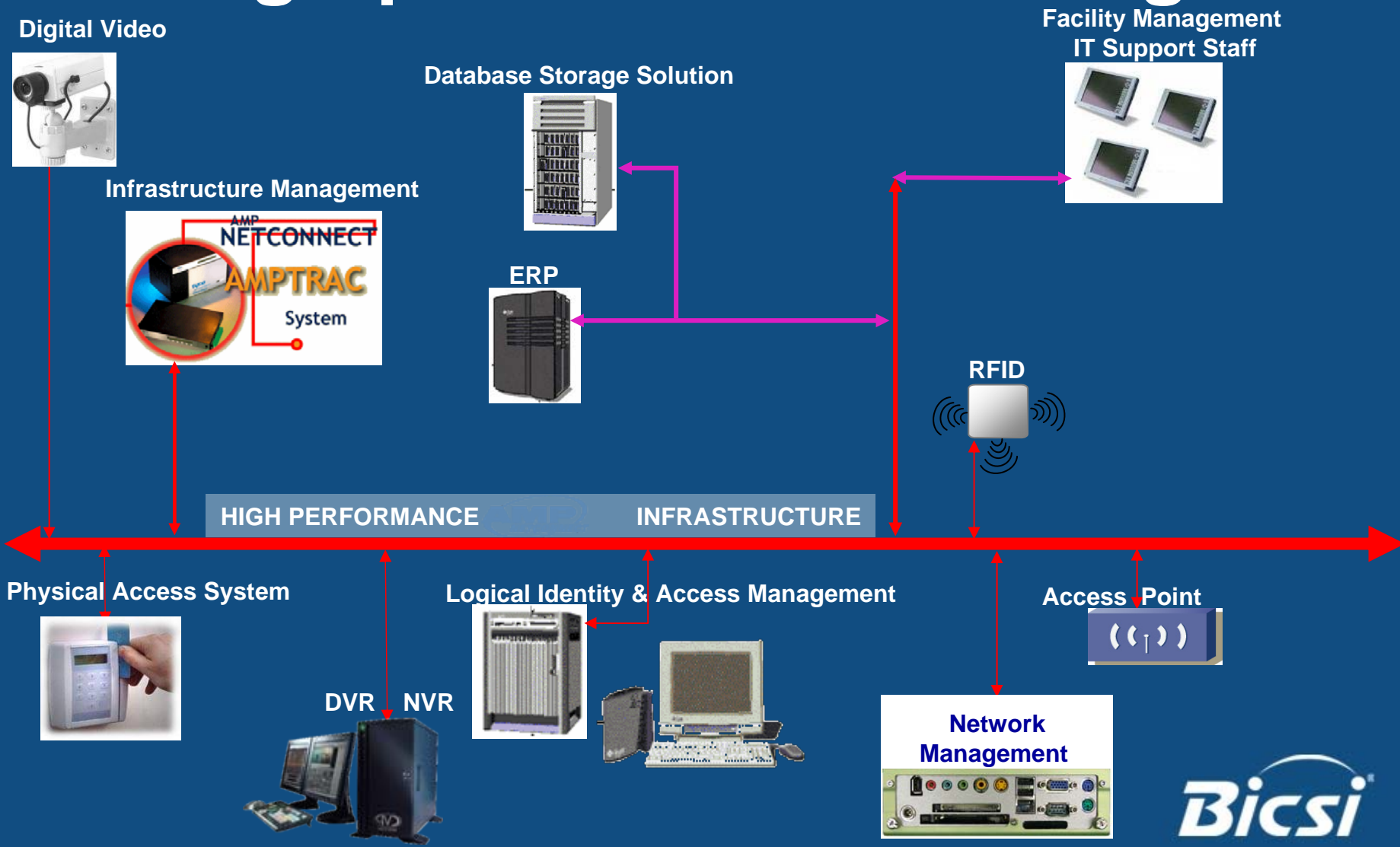
DVR NVR



Network  
Management



# Multiple IP-based Systems on High-performance Cabling



# Cabling Investment

- Cabling Becomes a Mechanism for Cost Reduction
  - Not a line item for cost reduction
- Cabling Becomes a Vital Asset
- You Become a Vital Asset

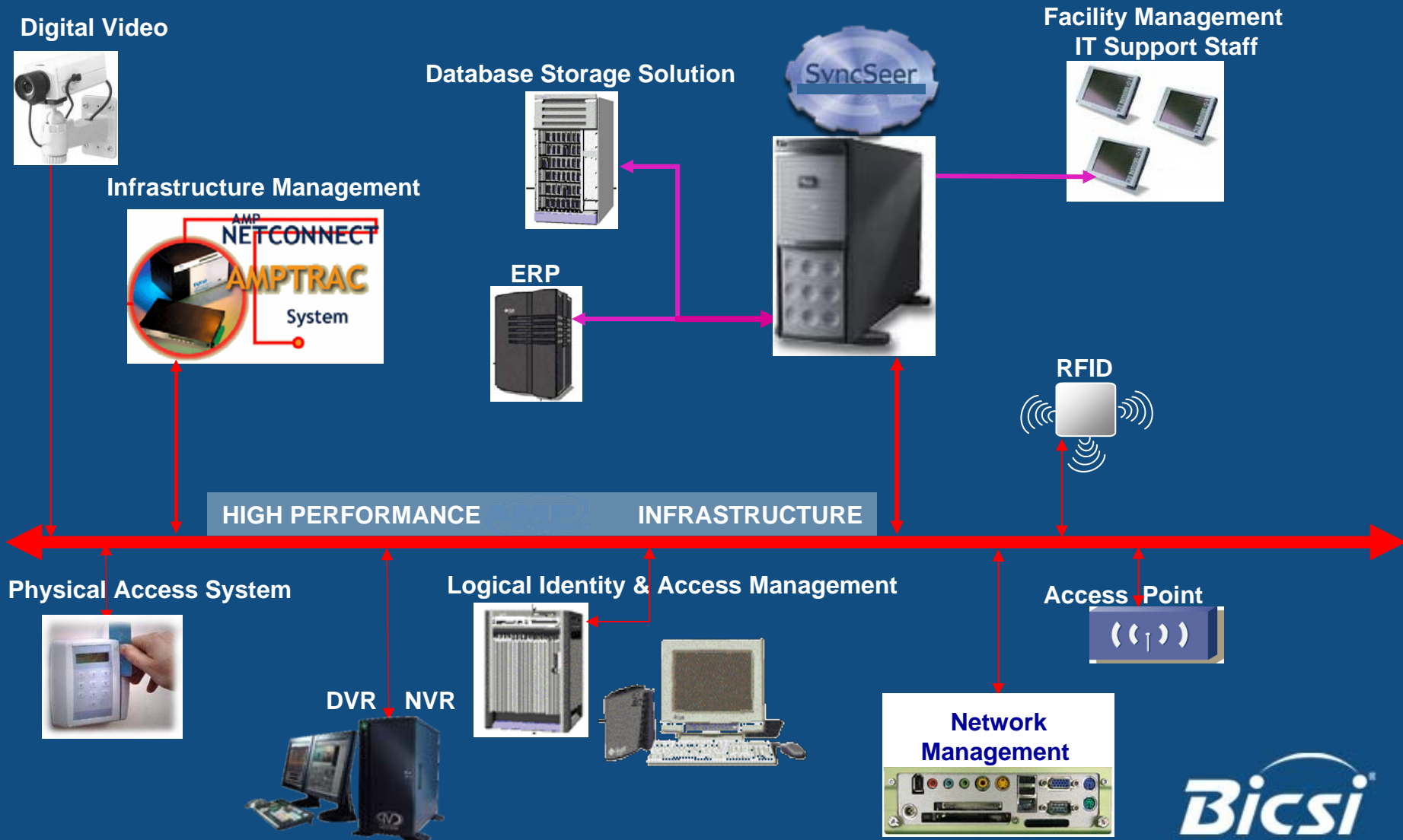
# Getting the Best Return

- Build a capable system
- Latency savings
- Compare traditional non-data systems with IP-based versions
  - Cost savings apparent especially compared to a stand-alone system

# IP Consolidation Challenges

- Integrate all these devices
- Integrate the data
- Process the data effectively
- Use the data effectively

# Collecting and Using Data from Multiple Sources



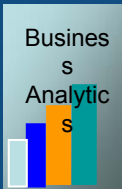
# Collecting and Using Data

## Data Collection

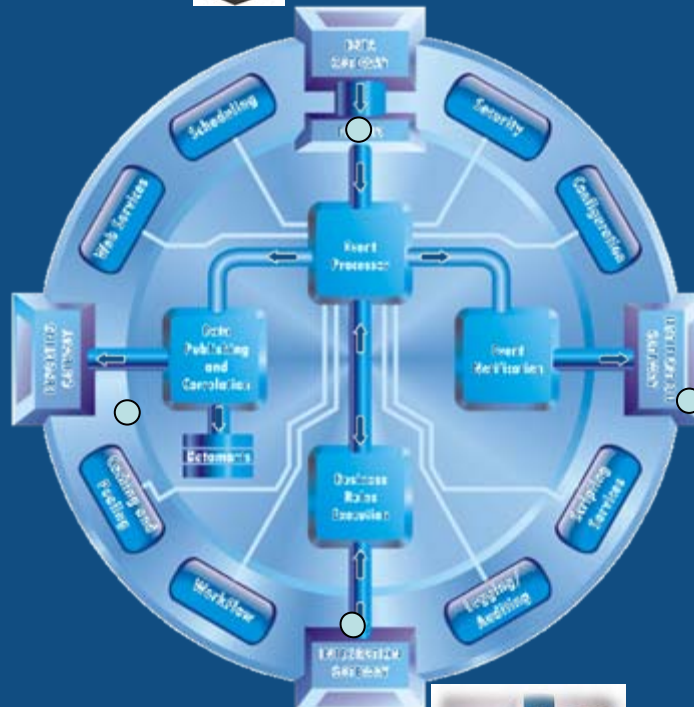


## Reporting/Admin

Instant Notification Log  
JPY 2/15/08 NGM 3/1/06



**Log Report**  
Incidents 1,545  
Triggers 98,4563  
Video Logs 3,798



## Notification



## Information Gateway

# Getting the Best Return

- Not enough?
  - Include asset protection, safety benefits and improved customer experience when these systems are tied together, communicate together and process the data appropriately
  - Compliance benefits
    - Recording the Who? What? When? Where?
- The Justification for Good Quality, High-speed Cabling

# Collecting and Using Data

- Government
  - Increased public safety through asset visibility, location and communications for first responders
  - Contractual compliance
- Entertainment/Gaming/Retail
  - Increase revenue through improved customer experience
  - Location-based services, targeted promotions, way-finding, line busting and other premium customer interactions

# Collecting and Using Data

- Healthcare
  - Track location, utilization and accessibility of key mobile assets
  - Correlate billable medical supplies and equipment to patients
  - Patient safety
- Education
  - Increase public, personal and asset security
  - Safety and operational efficiency integrating existing identity and access management systems

# Higher Education Use Case

Wake Forest University  
Winston-Salem, NC

# Wake Forest University Facts

- **Founded: 1834**
- **Enrollment (2006-07)**
  - Undergraduate: 4,321
  - Graduate and professional: 2,418
  - Total enrollment: 6,739
- **Academics: Top 30 academic school in the nation**

# Wake Forest University Facts

- 340 acre campus
- 57 buildings
  - Network Operations Center
- Cable Plant
  - >1,000mi of optical fiber cable
- 696 Wireless Access Points
- 244 wired network devices
  - ~160 Servers
  - ~10,000 nodes on the network

# Challenges Facing WFU

- Safety Challenges
  - Campus environment
    - Campus is a small city that never closes
    - Safety often is viewed as being intrusive
  - Safety is a major decision point for prospective students and parents
- Efficiency Challenges
  - Inefficient solutions create reactionary processes and procedures
  - Disparate “silo” solutions spread across multiple departments

# Challenges Facing WFU

- Cultural and Organizational Challenges
  - Interdepartmental relationships
  - Continuity of strategic direction across departments
  - Creating a sustainable developmental and operational business unit

# Existing Approach

- Tendency to address one challenge at a time
- Tendency to assign a challenge to one department
- That department tends to address solution internally

# Difficulties of Existing Approach

- Multiple “silo” solutions lead to high financial costs
  - Specialized network with no central management or monitoring
  - Solutions require dedicated cabling
  - Unable to fully utilize the university’s existing investments
  - Growth in staff

# Difficulties of Existing Approach

- Multiple “silo” solutions lead to substantial opportunity costs
  - Inefficient use of capital assets
  - Manual data manipulation
  - Manual data correlation
  - Laborious event search processes
  - Inefficient community notification and communication

# Drivers

- Budget constraints demands efficiency
  - Leverage common infrastructure resources
    - Reduced cable infrastructure costs and increased reliability
    - Reduced number of servers, databases and applications
  - Manage a growing number of physical devices without increasing staff
  - Deploy solutions delivering comprehensive information
    - Integration of multiple systems (Fire, Safety, Surveillance, etc)
    - More effective surveillance and event notification technology

# Leveraging IT Resources

- Systems, Networking and Database Design
  - Data Integrity, Backups, Disaster Recovery
  - Cable plant, hardware, engineering / design, redundancy, etc.
- Capacity / Performance Management
  - Service Level Agreement, 7x24 Notification, Trending, etc.
- IT Security, Policies and Procedures

# Deploying Comprehensive Solutions

- Intelligent middleware platform connecting different technology systems
- Leverages new and existing technology systems including
  - Active & passive RFID
  - Access control
  - Video security

# Scales Fine Arts Center

- Needed to control expensive assets in an open environment
- Integrated technologies
  - Active RFID tags and portals
  - Video surveillance
  - E-mail
  - SYNCSEER
- Defined business rules
  - Example: Policies for asset movement and removal

# Scales Fine Arts Center

- Comprehensive solution reduced financial costs
  - Cabling, Servers
  - Personnel (headcount)
- Comprehensive solution lead to improved efficiency

# Summary

- The key to making yourself valuable is making the infrastructure valuable
- The key to making the infrastructure valuable is to make the infrastructure capable