T01 - Select the Right Stratix® Switch for Your Application
## Key Customer Challenges

<table>
<thead>
<tr>
<th>Customer Challenge</th>
<th>Selection Criteria</th>
<th>Customer Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Availability needs not met</td>
<td>Resiliency Criteria</td>
<td>Unplanned downtime costs manufacturers $20 B a year</td>
</tr>
<tr>
<td>Network Performance needs not met</td>
<td>Performance Criteria</td>
<td>220,000 new engineers being hired every year through 2022 to connect the unconnected</td>
</tr>
<tr>
<td>Actionable Diagnostic data across multiple teams and disciplines</td>
<td>Diagnostic Criteria</td>
<td>Actionable information shows mean time to repair reductions of up to 75%</td>
</tr>
<tr>
<td>Risk Mitigation, help protect network availability and performance</td>
<td>Security Criteria</td>
<td>Average cost of a data breach is $4M</td>
</tr>
</tbody>
</table>
Is Your Network Infrastructure Providing the Availability You Need?

Use of Unmanaged vs. Managed Network Switches appear to cost less, but our experience has shown this to be untrue...

...this is validated in the first time you are challenged with resolving connectivity issues in your operations that are causing *unplanned downtime*.

Managed Switches provide key functionality that makes them more cost-effective in the long term.
Scenarios

Availability Scenario #1

Is your network infrastructure meeting your availability needs?

Is Your Network Infrastructure Providing You the availability you need?

**Challenge**
- Plugging cable in created an unmanaged Loop
- Broadcast messages get repeated in an infinite loop
- Network will crash as the broadcast storm grows
- Downtime and lost visibility to locate cause will result

**Resolution**
- Loop Prevention to stop this before it happens
- Diagnostics can be used to locate the cabling error
- Both Available on our Lightly and Fully Managed Switches
- Stratix 2500, 5700, 8000, 5400, and 5410
Is Your Network Infrastructure Meeting Your Availability Needs?

Availability Scenario #1
Is Your Network Infrastructure Meeting Your Availability Needs?

**Challenge**
- Cables are not always clearly marked
- Plugging cable in created an unmanaged Loop
- Broadcast messages get repeated in an infinite loop
- Network will crash as the broadcast storm grows
- Downtime and lost visibility to locate cause will result

**Resolution**
- **Loop Prevention** to stop this before it happens
- **Diagnostics** can be used to locate the cabling error
- Both Available on our **Lightly, Fully, and High-Performance Managed Switches**
- Stratix® 2500, Stratix® 5700, Stratix® 8000, Stratix® 5400, and Stratix® 5410 industrial Ethernet switches
Is Your Network Infrastructure Meeting Your Availability Needs?
Availability Scenario #2
Is Your Network Infrastructure Meeting Your Availability Needs?

**Challenge**
- Need to perform Infrastructure Maintenance
- Cannot impact real-time communications during runtime
- Network availability required even during planned downtime to support connectivity required for line maintenance and changeover tasks

**Resolution**
- Multiple Communication paths, **localize impact** of Infrastructure Maintenance
- Resilient communications will find alternative path with **no user intervention**
- **High-Speed Resiliency** options like Integrated DLR and REP recover connectivity quickly to help prevent data loss
- Available on **Fully and High-performance Managed Switches**
- Stratix® 5700, Stratix® 5400 and Stratix® 5410 industrial Ethernet switches
Is Your Network Infrastructure Meeting Your Availability Needs?
Availability Scenario #3
Is Your Network Infrastructure Meeting Your Availability Needs?

Challenge

- Need to perform infrastructure Maintenance
- Must not impact communications to critical systems
- Continuous operations = no downtime window for updates

Resolution

- Fully redundant LAN networks **preserve availability**.
- **High-Speed Redundant Network** options like PRP and redundant rings
- Support for **multiple Infrastructure devices** being removed/restored.
- Available with the **High performance Managed** Switch portfolio
- **Stratix® 5400** and **Stratix® 5410** industrial Ethernet switches
Is Your Network Infrastructure Meeting Your Performance Needs?

Unmanaged vs. Managed Network Switches appear to have common performance characteristics at a port level, but our experience has shown that this is not the whole story...

This is validated the first time you are challenged with adding capacity or migrating legacy equipment to a common network infrastructure in your operations resulting in **unplanned downtime** and project deployment risk.

<14% of manufacturers have tied their machines to the enterprise network

SOURCE: Industry Week

**Nearly 3/4** of U.S. plants are more than 20 years old

220,000 New engineers every year until 2022 to connect the unconnected

The World Bank Studies

### VALUE TO CONNECT

**SYSTEMS AT STAKE**

**Increased** Production uptime – Oil and Gas Industry

**Shared Infrastructure** reduced maintenance costs - Chemical Industry

**Man-Hours** saved in manual generation of reports - Wastewater
Is Your Network Infrastructure Ready for Your Future Needs?

You do not want your data flow to look like this.

Careful planning is required, not only for today’s needs, but the needs of the future as more devices begin to integrate into your operations networks...

Connect and Enable Improved Operations with the right switching solution for your application
Are You Considering Network Performance Needs for the Conditions Other Than Runtime?

Performance Scenario #1
Is Your Network Infrastructure Meeting Your Performance Needs?

Challenge

• Web camera on the network required additional performance
• The switch became overwhelmed with communication demands causing delays
• Devices on production lines did not get expected packets
• Communication timeouts can cause a fault to occur

Resolution

• Critical traffic can be prioritized to mitigate these risks
• Control devices can be virtually separated from others on the network
• Available on Lightly, Fully, and High performance-managed offerings
• Stratix® 2500, Stratix® 5700, Stratix® 8000, Stratix® 5400 and Stratix® 5410 industrial Ethernet switches
Are You Considering Network Performance Needs for the Conditions Other Than Runtime?

Performance Scenario #2
Is Your Network Infrastructure Meeting Your Performance Needs?

Challenge

- Communication dependencies between the systems in question are not obvious
- Chokepoints in the network are not visible
- Common network infrastructure to support different communication types
- Different application performance requirements

Resolution

- **Quality of Service (QoS)** optimized for multi-disciplined networks required
- **PTP participation** to optimize performance for high precision
- Available in our **Fully and High-Performance Managed Switches**
- Stratix® 5700, Stratix® 8000, Stratix® 5400, and Stratix® 5410 industrial Ethernet switches
Are You Considering Network Performance Needs for the Conditions Other Than Runtime?

Performance Scenario #3
Is Your Network Infrastructure Meeting Your Performance Needs?

Challenge

• Open Interfaces were not fast enough for new equipment
• IP addresses on new equipment were already in use

Resolution

• All Gigabit options offer greater flexibility for Interface usage
• High-Performance Managed Switches support those options
• Stratix® 5400 and Stratix® 5410
• NAT Features allow IP addresses to be reused
• Available on Fully and High-Performance Managed Switches
• Stratix® 5700, Stratix® 5400 and Stratix® 5410 industrial Ethernet switches
What Is Your Network Saying and Who Can Help?

Operations today suffer downtime from unknown causes

- If your network goes down, actionable diagnostic information from your Network Infrastructure, can help resolve faster than a person without data.

ACTIONABLE INFORMATION IMPACTS OPERATIONS

75% DECREASE IN MEAN TIME TO REPAIR
Integrated OT & IT Network infrastructure connected
21 remote sites
Information readily available to resolve issues

57% OF ORGANIZATIONS INCREASED THROUGHPUT
58% OF THESE INCREASED QUALITY
Are You Hearing and Understanding What Your Network is Saying to You?

Diagnostic Scenario #1
Is Your Network Infrastructure Providing You the Visibility You Need?

Challenge

- Unmanaged Switches do not have any port diagnostics
- No visibility or counters that could be leveraged
- Nuisance faults occur intermittently
- No indications that cables are becoming marginal until failure occurs

Resolution

- **Port Diagnostics** are available for visibility
- **Lightly, Fully, and High Performance Managed Switch** options available
- Features enabling *visibility* on the operator terminal
- **FactoryTalk® View Faceplate** provides actionable information
- **Stratix® 2500, 5700, 8000, 5400, and 5410**
Are You Hearing and Understanding What Your Network is Saying to You?

Diagnostic Scenario #2
Is Your Network Infrastructure Providing You the Visibility You Need?

**Challenge**
- No visibility to tools typically used in IT roles
- Escalation path for communications issues using other diagnostic tools
- Operations do not manage switches higher in the architecture
- Coordination of shared Infrastructure changes

**Resolution**
- **Cisco IOS** help confirm compatibility with common IT tools
- Facilitates **collaboration** with remote expertise to solve communications issues impacting operations
- Available on **Fully and High-Performance Managed Switches**
- Stratix® 5700, 8000, 5400 and 5410
Is Your Network Infrastructure Providing You the Defense You Need?

Use of Unmanaged vs. Managed Network Switches appear to cost less, but our experience has shown that this to be untrue.....

. This is validated in the first time you are challenged with a security event resulting in unplanned downtime.

Managed switches provide key security benefits that make them the cheaper option in the long term.
Is Your Network Infrastructure Mitigating Risk?
Risk Mitigation Scenario #1
Is Your Network Infrastructure Providing You the Risk Mitigation That You Need?

Challenge

• No ability to verify that an open port is being used.
• No ability to lock unused ports
• No ability to isolate devices that were accessible via the network
• No ability to centrally manage user access

Resolution

• **Port Security** can be used to detect new connection
• Unused ports can be locked to help prevent **unauthorized access**
• Devices can be segmented in groups with **VLAN features**
• to limit access
• Features available on **Lightly, Fully and High Performance**
• **Managed switches**
• Stratix® 2500, Stratix® 5700, Stratix® 8000, Stratix® 5400, and Stratix® 5410
Is Your Network Infrastructure Mitigating Risk?
Risk Mitigation Scenario #2
Is Your Network Infrastructure Providing You the Risk Mitigation That You Need?

**Challenge**
- Some connectivity needed for the Plant
- Need to limit web connectivity to reduce risk
- Web access rules need to be enforced
- Visibility to network communication flows not possible

**Resolution**
- **Access Control Lists (ACLs)** can be used to enforce basic policies
  - Available on **Fully Managed Switches**
  - Stratix® 5700, 8000, 5400, and 5410
- **Netflow Features** can be used to provide better visibility to communication patterns
  - Available on **High-Performance Managed Switches**
  - Stratix® 5400 and 5410
# Key Customer Challenges

<table>
<thead>
<tr>
<th>Customer Challenge</th>
<th>Solution</th>
<th>Lightly Managed</th>
<th>Fully Managed</th>
<th>High Performance</th>
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<tbody>
<tr>
<td>Unplanned downtime</td>
<td>Loop Prevention</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>High-Speed Resiliency</td>
<td></td>
<td>✓</td>
<td>✓</td>
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<td></td>
<td>Redundant Networks</td>
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<td>✓</td>
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<tr>
<td>Network Performance needs for the future and unexpected</td>
<td>Port Prioritization / Virtual Segmentation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
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<td></td>
<td>Network Prioritization / Multi-Disciplined</td>
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<td>✓</td>
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<tr>
<td></td>
<td>Extended Gigabit</td>
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<td>✓</td>
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<tr>
<td>Collaboration with remote experts on communications</td>
<td>Visibility in Operations Tools</td>
<td>✓</td>
<td>✓</td>
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## Network Switch Product Overview

### Stratix® Models
- **Stratix® 2000**
- **Stratix® 2500**
- **Stratix® 6000**
- **Stratix® 5700/ArmorsTratrix™ 5700**
- **Stratix® 8000/Stratix® 8300**
- **Stratix® 5400**
- **Stratix® 5410**

### Managed Levels
- **Unmanaged**
- **Lightly Managed**
- **Fully Managed**
- **High Performance Managed**

### FEATURES
- 100M/1G
- 1G/10G
- 100M
- 100M/1G

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Additional Material
CPwE Architectures - Cisco and Rockwell Automation®

- **CPwE website**
- **Overview Documents**
  - Alliance Profile
  - Top 10 Recommendations for plant-wide EtherNet/IP Deployments
  - Design Considerations for Securing Industrial Automation and Control System Networks

Check out our Stratix® Reference Guide [here](#)!
Thank You!