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# Chassis Switches Capacity Optimization and Re-Utilization

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**Abstract: In today's fast-paced business environment, IT organizations must deliver services efficiently to meet growing customer expectations. This paper focuses on optimizing network infrastructure to support increasing demand for device connectivity. Specifically, we aimed to identify opportunities to maximize the utilization of Aruba chassis switches by redistributing modules across supported areas, driven by the need to accommodate rising customer requests for end-user device connectivity amidst limited port availability. Through collaboration with subject matter experts, we explored ways to optimize network switch ports and improve overall efficiency.**

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## I. INTRODUCTION

"The organization operates across a vast geographical area, with diverse operations that require a robust IT infrastructure. To support this, the IT department has adopted a hybrid structure, combining specialized functional teams at the headquarters with regional units that provide on-the-ground support to customers nationwide. The Regional IT Department (RITD) plays a critical role in maintaining IT infrastructure, providing onsite support for end-user devices, computing, and communication systems. To manage customer requests, incidents, and service needs, RITD leverages various corporate solutions.

This setup enables RITD to deliver specialized IT services efficiently and effectively to its dispersed customer base. However, with growing customer expectations for rapid service provisioning, RITD recognized the need to optimize its IT infrastructure. As part of this effort, the department initiated a project to maximize the utilization of Aruba chassis switches by redistributing modules across all supported areas, aiming to improve overall efficiency and meet increasing customer demands."

## II. LITERATURE REVIEW

A business process is a crucial aspect of ensuring the efficient management of resources within an organization. In the context of Local Area Networks (LANs), a business process can be defined as a set of procedures designed to optimize the utilization of network resources, such as switches.

One key aspect of LAN management is the monitoring and analysis of switch capacity and active ports. This information is typically extracted from LAN switches reports, which provide valuable insights into the current state of the network. For instance, these reports can help identify switches that are operating at high utilization levels, which can impact network performance.

To determine the optimal utilization threshold for switches, it is essential to consult with Subject Matter Experts (SMEs). In this case, SMEs agreed that a utilization rate of 75% of active ports is a reasonable target, with 25% of active ports reserved for future use. This threshold serves as a benchmark for classifying switches into high utilization (more than 75%) and low utilization (less than 75%) categories.

Furthermore, these switches offer modular expansion capabilities, with the J9850A supporting up to six modules and the J9851A supporting up to twelve. Each module typically provides 24 LAN ports.

The configuration of each module, which typically contains 24 LAN ports. By considering excess ports that are not currently in use, network administrators can identify opportunities for optimization. This information can be used to calculate future capacity and utilization, with the goal of maintaining all switches at 75% or less utilization.

To achieve this goal, it is essential to implement a robust tracking system that can monitor switch utilization and capacity in real-time. This can be achieved using specialized software and hardware tools, such as network management systems.

The decision to adopt a 75% utilization threshold was based on industry best practices and benchmarking studies.

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By adopting this threshold, organizations can ensure that their networks operate at optimal levels, with sufficient capacity to meet future demands.

## III. METHODOLOGY

➢ *Achieves the Target of Optimizing LAN Switch Utilization, the Following Steps were Taken:*

- *Data Collection:*

All required reports for LAN switches in the company were generated, including switch type, switch capacity, and active ports.

- *Data Analysis:*

The following columns were added to the report using formulas: Calculated percentage of switches utilization: This was done to determine the current utilization rate of each switch.

- *Switch Classification:*

The report was divided into two categories: High Utilization Switches and Low Utilization Switches.

### A. *High Utilization Switches (≥ 75%):*

To maintain switch utilization at 75% or less, the following steps were taken:

- Identification: Switches with utilization rates of 75% or higher were identified.
- Excess Utilized Ports Calculation: The excess utilized ports were calculated using the Excess Utilized Ports formula.
- Required Module Calculation: The required number of modules was calculated to maintain switch utilization at 75% or less.
- Switch Utilization and Capacity Calculation: The switch utilization and capacity were recalculated after adding the required module.

$$Excess\ utlized\ ports = active\ ports - (Current\ Caocity \times 0.75)$$

$$Required\ Moduel = Excess\ utlizition\ ports \div 24$$

$$Capcity\ to\ be = (Required\ Moduel \times 24) + Curent\ capcity$$

$$Utlizition\ to\ be = active\ ports \div Capcity\ to\ be$$

### B. *Low Utilization Switches (< 75%):*

To maintain switch utilization at 75% or less, the following steps were taken:

- Identification: Switches with utilization rates of less than 75% were identified.
- Excess Ports Calculation: The excess ports were calculated using the Excess Ports formula.
- Required Module Calculation: The required number of modules was calculated to maintain switch utilization at 75% or less.
- Switch Utilization and Capacity Calculation: The switch utilization and capacity were recalculated after removing the required module.

$$Excess\ ports = Current\ capcity - (Active\ port \div 0.75\%)$$

$$Excess\ Moduel = Excess\ ports \div 24$$

$$Capacity\ to\ be = Current\ Capcity - (Excess\ Moduels \times 24)$$

$$Utilizition\ to\ be = Active\ Ports \div Capcity\ to\ be$$

## IV. ANALYSIS / FINDINGS

As a result of this exercise, successfully optimized 133 switches across 7 geographical areas. We were able to extract and reuse 150 modules in 43 switches, while designating the remaining 107 as spare parts.

## V. CONCLUSION

In summary, the implementation of sample formulas successfully liberated over 3,500 ports for future use, resulting in a significant cost avoidance of $450,000. This achievement underscores the effectiveness of strategic resource management in enhancing operational efficiency.

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