Network Optimization for Microsoft Teams in a Large Enterprise

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Abstract:
This research paper highlights the transformation phase of the existing video conferencing infrastructure at company A towards Microsoft Teams Room(MTR), the centre of focus for this is generally the network optimization, technical evaluations, hardware compatibility as well as the performance result after the implementation were performed. The Analysis compares MTR-W and MTR-A implementation using certified hardware such as Cisco, basically explaining the quality improvement and strategic choices post network optimizations. This study gives a more detailed insight of collaborative engineering actions, real time testing as well as the user experience for enhancements. The company was facing varieties of challenges during the transformation such as multi-OS inconsistencies, suboptimal video call quality, certification limitations and the need for real time AI collaboration feature which was clearly lacking. The performance data was collected for pre and post implementation to explain the large-scale shift to MTR, showcasing how smart planning, cross-functional execution and technical validation can lead to seamless, future-proof collaboration experience.

Keywords: Microsoft Teams Room (MTR), Video Conferencing, Network Optimization, MTR- Android, MTR- Windows, Teams AI Features, Cisco Room Bar, SRTP Traffic Prioritization, AV System Transformation, Cisco to Teams Migration.

I.INTRODUCTION

Digital Workspace has now become a more collaborative environment for employees to work according to their preferable as well as comfortable location. Technology showcasing collaboration has become mission critical for communication, seamless coordination and productivity. At Company A, where cutting edge innovation is constant, the backlash of its existing video conferencing systems began to cause problems in their performance, user experience as well as reliability. To evolve with the company's high standards and requirement for remote collaboration, a major transformation was needed. The transformation to Microsoft Teams Room from Cisco based video conferencing is presented in this research paper.

Background Information:

- Company A previously relied on Cisco VC systems operating on Linux-based platforms with Android overlays.
- With Microsoft Teams becoming the preferred collaboration platform internally, there was a need for tight hardware-software integration, reliable AI features, and native support for Teams-based conferencing.
- The goal was to migrate to MTR systems - both Android and Windows variants - without compromising call quality, user experience, or supportability.

The key objective of company A was that conferencing transformation should showcase, standardize and modernize collaboration experiences across the offices by adopting Microsoft Teams Room as a main platform. The shift was due to several technical as well as motivational challenges such as there was inconsistency in hardware support across the company's existing Cisco conferencing system, most of them lacking the basic certifications for MTR compatibility. In addition to the above, hybrid configuration using overlay technology or USB passthrough most probably led to unreliable feature access and performance instability. This compounded the issue as packet loss, network - related problems, bandwidth constraints as well as degradation in wireless performance, specifically over 2.4GHz networks. To address these limitations, Company A conducted various internal hardware compatibility assessments which revealed that only about 3-4% of current Cisco units was able to natively go with MTR-A, beside another 18-20% was able to function with USB passthrough mode(with missing features and less reliability). Rest of the units required replacement or retrofitting.

This led to a structured evaluation of three implementation models:
- MTR-Windows with certified third-party cameras such as Logitech (which offered full feature support and Microsoft certification)
- Native MTR-Android on Cisco Room Bars (certified but with some OS integration issues)
- Cisco Room Bars in USB passthrough mode with MTR-Windows (unsupported and unstable but cost optimum)

Parallelly, Company A upgraded the network infrastructure to support timely collaboration at scale - basically doubling the bandwidth capacity from 10Gbps to 20Gbps, implementing Quality of Service (QoS) to prioritize encrypted media streams (SRTP), and removing legacy packet manipulation tools like Riverbed. Wi-Fi recommendations were also revised to favor 5GHz connections, significantly improving wireless call quality. Performance monitoring tools such as Vyopta, Pexip, and Microsoft Teams call analytics were used to collect pre- and post-implementation data, which revealed dramatic improvements in call quality, network stability, and overall user experience - particularly in high-density campuses like Site A and Site B. This paper presents the decisions, technical strategy, and outcomes of Company A's MTR migration, offering actionable insights for organizations facing similar transitions. It highlights the importance of coordinated hardware and network readiness, evaluates trade-offs between MTR-Windows and MTR-Android configurations, and provides a replicable model for enterprise-scale collaboration modernization.

Objectives covered in this research paper are mentioned below:
- Marks the importance of collaboration between network, engineering, and vendor teams (e.g., Microsoft and Cisco) in achieving seamless transformation.
- Compared multiple implementation models for MTR deployment such as:

- MTR-Windows with certified third-party cameras
- Native MTR-Android on Cisco Room Bar
- USB Passthrough mode along with Cisco Room Bar and MTR-W

- Technical limitations were analysed for hybrid conferencing configurations for the risks of using unsupported or uncertified hardware setups.
- Assess the recent network infrastructure e.g., packet loss, Wi-Fi problems, bandwidth constriction which all were affecting Teams call quality.
- Implement as well as document the network optimizations which included Quality of Service (QoS) configuration, bandwidth enhancement, and removal of outdated traffic-shaping tools.
- Compare and Measure Video Conferencing performance for both before and after infrastructure and hardware update using tools like Vyopta, Pexip, and Microsoft Teams logs.
- Rank the implementation options based on stability, feature support, certification, and overall user experience.

- Present a replicable transformation framework for enterprises planning to modernize their VC infrastructure to Microsoft Teams Rooms.
- Evaluate the compatibility of existing Cisco video conferencing hardware with Microsoft Teams Rooms (MTR), both Android and Windows variants.

II. LITERATURE REVIEW

As we already know that the modern workspaces are evolving continuously, the tools used should also be enhanced with growing time which would lead in the collaboration of employees across distance, time zones as well as platforms. For many companies the journey towards modernizing video conferencing infrastructure is not only about swapping various devices, rather realigning the main architecture of communication. Traditional setups based on Cisco video conferencing units, have served their time with stability and reliability. If these systems are placed in front of MTR platforms, they would start showcasing their limitations. The current Cisco hardware is officially certified with MTR-A, but the majority lies outside the certification range or requires makeshift adaptations such as ISB passthrough modes. What is more compelling than an authentic certification is experience - specifically while comparing MTR-A and MTR-W. But no conferencing setups, however advanced it is, lacks the network requirements. The real time nature of video conferencing is more than mere bandwidth. Quality of Service(QoS), removal of intrusive elements, intelligent routing etc are all recommended practices for ensuring stable SRTP traffic. Companies that have followed this path often show improved call clarity, reduced jitter and minimised packet loss.

The platforms help IT teams to turn abstract trends into actionable insights, often revealing gains in performance of call post-deployment. Such data-driven validation is an essential part of migration procedure, guiding information and explaining future configuration. Finally, transformation at this scale benefits not from a single sweep, but from an iterative, hybrid approach. A hybrid strategy is often the most pragmatic path to full transformation. Monitoring various tools provide the feedback necessary for ongoing improvement.

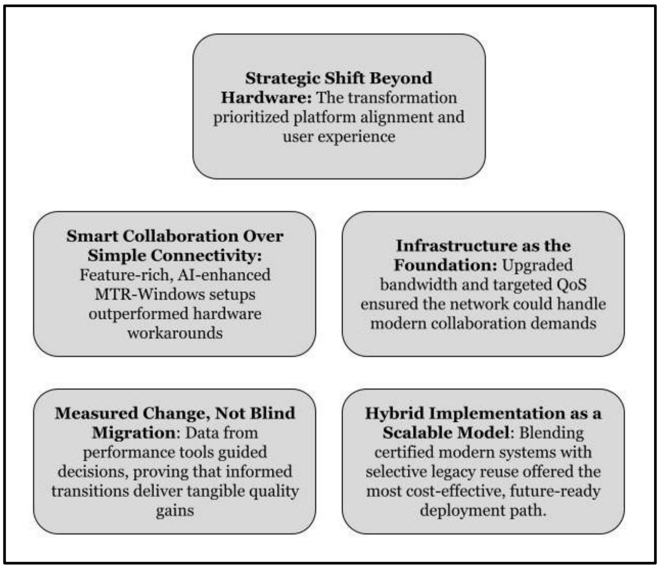

Fig. 1 Key Strategies for Network Optimization

III.PROBLEM STATEMENT

Companies' environments mostly depend on modern, intelligent video conferencing platforms which majorly support user friendly, scalable and feature-rich experience across geographies. Company A, like other global organizations, had standardized on Microsoft Teams as its unified collaboration platform collaboration area. As we already know that the Cisco room system was not designed to function natively within the MTR ecosystem, so this limitation created a multi-layered challenge.

- Only a limited amount of subset for legacy Cisco hardware was officially compatible with MTR android deployments, while a small portion was able to function via USB passthrough.
- Company A faced a lot of performance inconsistency in hybrid configuration.These inconsistencies led tk unreliable video quality,stuttering during video conferences along with lack of access to teams- native AI features like layout optimization and intelligent framing- critically important during hybrid calls.
- The underlying infrastructure of the network, which was not fully optimized for high performance as per AV traffic, was a concern. Persistent obstacles such as lack of quality, and RTP packet loss resulted in degradation of call quality, poor end user experience as well as increased support team assistance- specifically in high density office environments.

Category	Details
Total Cisco Conference Rooms	714
Total Teams Phones	785
Total POC MTR Rooms	10
Direct Compatibility (Native MTR-A)	3–4% of Cisco hardware models
USB Passthrough Compatibility	18–20% of Cisco hardware supports this mode
Hardware Requiring Retrofit	All other models (e.g., DX, SX, Codec+, Pro) need complete hardware changes
Implication	Majority of hardware needs replacement or reconfiguration for MTR migration

Table 1. Cisco Hardware Compatibility with Microsoft Teams Rooms.

Therefore, the core problem addressed in this research is twofold:

- To identify and evaluate viable MTR deployment strategies that balance certification, functionality, reliability, and cost-effectiveness—through comparative analysis of MTR-Windows, MTR-Android, and USB passthrough modes.
- To optimize the supporting network infrastructure to ensure Teams traffic is prioritized, stable, and capable of delivering a consistent, high-quality user experience across global offices.

IV.METHODOLOGY AND COMPARATIVE ANALYSIS

To address the challenges which were identified during the transformation to a Microsoft Teams Room model, company A utilized a more structured, data driven and iterative approach. Transformation generally involved three core phrases: technical discovery, network optimisation and performance validation- everything was cross functionally collaborated between engineering, IT and vendor partners.

Technical Discovery: The very first step in the transformation was a comprehensive audit of the existing traditional conferencing system, which generally consists of 714 rooms across the globe. This was used to categorise devices based on their compatibility with MTR- A and MTR- W. With this analysis company A was able to build a segmented implementation plan, aligning specific room types- small, medium, large or huddle spaces with the appropriate MTR deployment.

Comparative evaluation of deployment models: Real world testing and scenario- based evaluation of three MTR setups were performed:

PEXIP	Before	After
Bad Quality Calls*	85 (3%)	25(0.9%) ↓
Fair Quality Calls*	490 (18%)	11(0.3%) ↓
Total Calls	2602	2772

Fig.2 Log collected from Pexip registered VC unit pre Bandwidth increase on Site A

MTR	Before	After
Bad Quality Calls*	7 (6%)	1 (0.6%) ↓
Fair Quality Calls*	19 (15%)	0 (0%) ↓
Total Calls	123	158

Fig.3 Log collected from MTR registered VC unit post Bandwidth increase on Site A

VC calls on Pexip Environment dropped from 21% to 1.2% while VC calls on MTR Environment dropped from 21% to 0.6%

- MTR-Android on Cisco Room Bar: Certified by Microsoft and Cisco, suitable for fast deployment but showed inconsistent performance due to multi-OS design and delayed feature parity.
- USB Passthrough on Cisco Room Bar (with MTR-Windows): Allowed hardware reuse but lacked official support and had noticeable limitations in video performance and AI features.
- MTR-Windows + Certified Peripherals: Offers full feature support, AI-enhanced video, and Microsoft-certified stability.

Network Optimization and Infrastructure upgrade: Company A recognised that hardware alone was not able to give an optimal performance.
- Upgrade in Bandwidth: Increased core network capacity was done which ranged from 10Gbps to 20Gbps to handle AV traffic more efficiently and effectively.
- QoS (Quality of Service) Implementation: Company A prioritized SRTP packets to make sure consistent audio/video performance was visible during peak usage.
- Deactivation of Traditional Network Elements: Disabled deep packet inspection, removed Riverbed traffic shaping, and also avoided SIP ALG, which was previously interfering with RTP traffic.

- Enhancements in Wi-Fi Policy: The shift preference moved to 5GHz networks over 2.4GHz to reduce call degradation because of signal interference.

Future Enhancements and Recommendations: While the transformation achieved major milestones, several opportunities remain to enhance the collaboration experience further:
- Extend AI Feature Support: Ensure all rooms benefit from Microsoft's latest intelligent meeting features by prioritizing MTR-Windows in critical locations.
- Centralized Management Tools: Integrate tools like Microsoft Teams Admin Center or Logitech Sync for consistent room monitoring and remote management.
- Expand Certified Peripherals: Adoption of additional certified audio/video peripherals to grow across more room types.
- Automated QoS Monitoring: Deploy tools to proactively alert network degradation before it impacts end users.
- User Training & Adoption Programs: Educate employees on best practices for hybrid meetings to maximize ROI from MTR infrastructure.

V.RESULT AND ANALYSIS

After the implementation of MTR(Microsoft Teams Rooms) and along with this an associated network enhancement, a noticeable improvement in video conferencing quality was observed across different environments. The data collected from a video conferencing system integrated with MTR platforms revealed a drop in call experience like the quality reflected poor reviews.

Video Conferencing (VC) Call Quality: Legacy Systems vs. MTR Integration: The percentage of poor-quality calls dropped from 21% to 1.2%. This highlights an over 94% improvement in VC call quality post-transition. A significant reduction in poor-quality calls was observed in VC systems that were previously part of a traditional Pexip environment.

Microsoft Teams Room (MTR) Environment Performance: The rate of poor-performing calls decreased from 21% to 0.6%. VC calls made through the MTR environment also showed a major quality improvement.

Impact of Network Enhancements: Enhanced prioritization of audio/video (AV) traffic via QoS was seen. Increased network bandwidth was also noticeable post changes.

Quantifiable Improvements: Minimized connection drops during sessions, enabled advanced Microsoft Teams features, contributing to a better user experience and reduced jitter and packet loss was seen.

The data confirms that aligning certified hardware with optimized Teams infrastructure delivers tangible benefits in VC reliability and performance. These results serve as a validation of the strategic direction taken and provide a solid foundation for scaling the MTR solution across additional rooms and locations.

VI.CONCLUSION

The research paper was able to observe technical, strategic as well as operational dimensions of transforming the traditional video conferencing environment into a modern, Microsoft Teams Room based collaboration infrastructure within a large scale enterprise. Through analysing deployment models, network readiness as well as hardware compatibility in a detailed manner, becomes an evident event that shows success in transformation which extends far beyond device replacement - this requires a holistic approach which blends company modernization, user-centric design and platform alignment.

The comparative evaluation of three deployment strategies - MTR-W with certified cameras, USB passthrough with Cisco-based room Bar and native MTR- Android - this highlighted main trade offs between certificate status, long term supportability and functionality. MTR-W emerged as a feature complete solution along with features which are most robust, offering more access to Microsoft Teams AI enhanced experience as well as system reliability. On the other hand MTR - A gives a simpler setup for more compatible devices, it exhibits inconsistencies in feature rollout as well as stability. USB passthrough, yet cost effective, presented notable limitations in performance and lacked vendor support- making this less suitable for company wide deployment.

As the above mentioned features are necessary there is the optimization of the underlying infrastructure of the network. By upgrading core bandwidth, removing traditional bottlenecks like deep packet inspection, implementing Quality of service and riverbed traffic shaping, and prioritising 5GHz Wi-Fi, the organisation ultimately reduced video call failures, enhanced user satisfaction and improvement in quality was seen. Such improvements were validated by real time analysis from various platforms such as Pexip and Microsoft Teams CQD which shows measurable reduction in jitter, packet loss as well as poor call experiences - specifically in high density campuses.

Ultimately, the paper demonstrates that the path to a scalable and intelligent collaboration area lies in a hybrid and balanced deployment strategy - one which leverages certified hardware for core rooms, reuse capable legacy systems where feasible, and ensure a network which can cater the needs and requirements of the modern day enterprises. Looking ahead, organizations must remain agile by continuously monitoring performance, engaging with vendors for support and feature alignment, and evolving their infrastructure to meet future workplace dynamics. The insights shared in this study serve as a replicable framework for enterprises embarking on a similar journey toward unified, cloud-integrated, and high-performing collaboration ecosystems.

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