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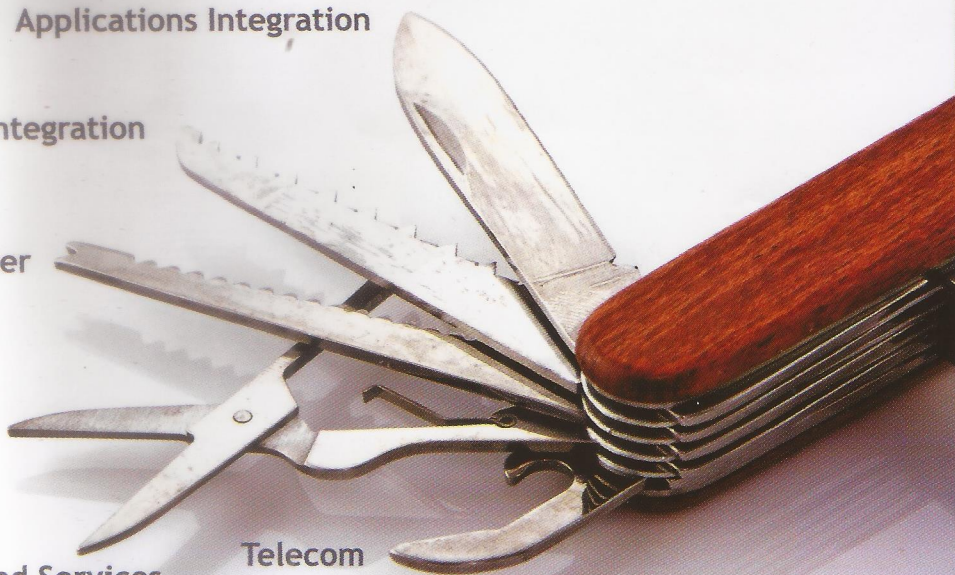
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Integrating Communication Network – the Viraj Way

Viraj Profiles Limited, a USD 1.5 billion empire founded by visionary Chairman Neeraj Raja Kochhar has had a very aggressive growth strategy since its inception in 1990. Over the past more than two decades, this group has built eight factories and numerous offices across India and abroad and has business relations with numerous customers and suppliers across six continents spread over more than 90 countries. Viraj Profiles Ltd. is globally one of the leading producers of stainless steel Long products and is the largest exporter of SS Long products in India. Resultantly, communication network and selection of equipment and partners is a critical area of consideration and an ever-evolving strategy is crucial to the path to success. This article is intended to be an overview of our network growth so far and it also outlines a plan for 3 years from now.

Journey So Far

Viraj Profiles has a data center in its Tarapur office which is a central location, and it also hosts the Head Office and all its manufacturing facilities and Inland Container Depot. There are eight factories and 10 offices spread over a 10-km stretch in and around this location. We have an *On-Premise Disaster Recovery System* in Mumbai, which is at a distance of around 100 km. In addition to that, we also provide network for other offices in Mumbai and other cities in India and abroad.

We currently have around 900 computers that are networked to various servers running Windows 2000, 2003, 2008, Linux Redhat, CentOS and AIX. And our support to IT operation and network support is provided by our in-house technical team. The network team majorly

consists of two sections, one of which takes care of day to day business and the other takes care of growth and security aspect of the company. We also include members from other IT infra groups for special projects.

Our offices in Tarapur are connected over a 100 Gig optical fiber in a star configuration and the offices in Mumbai and other locations are connected through a 4-MBPS MPLS. Typical utilization of our bandwidth is between 75 and 85% at peak load and 25 and 50% during off period. As far as Tarapur data center is concerned, we are supported by three independent uplinks – 10 Mbps uplink from Sify and alternate links from Vodafone and Reliance. Our network team is committed to 24x7 support to all networking needs as that is the business demand. As far as switches, routers, and other equipment are concerned, we are largely dependent on CISCO products although in some places we have also deployed other vendors like D Link, etc.

Challenges for a Network Manager

- The first challenge which we face is non-availability of reliable stable Internet uplink connection.
- Since the growth has become very fast and also the work locations change quite often, the network growth is a little inorganic and causes network failure at times. Also, use of media converters in many areas is a concern as they are prone to failure.
- Dependency on fiber optic (FO) cable is poor as the FO has been laid overhead and despite two parallel lines laid, the FO gets cut quite often, forcing us to shift the network to radio link. The radio link does not give good throughput during monsoon. Latency is quite



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high at times and thus our critical applications like SAP and Mailing suffer.

- The network equipment like switches, media convertors, hubs, etc., get damaged as power supply situation is poor and once an equipment fails, getting it repaired or replaced is tough, being away from Mumbai and, therefore, we are forced to keep lots of spares, which is not very cost effective.
- Non-availability of shutdown period creates problem for overall revamping.
- Network security is a real threat and we are in the process of hardening it as far as we can.

Network Equipment Selection Is Critical

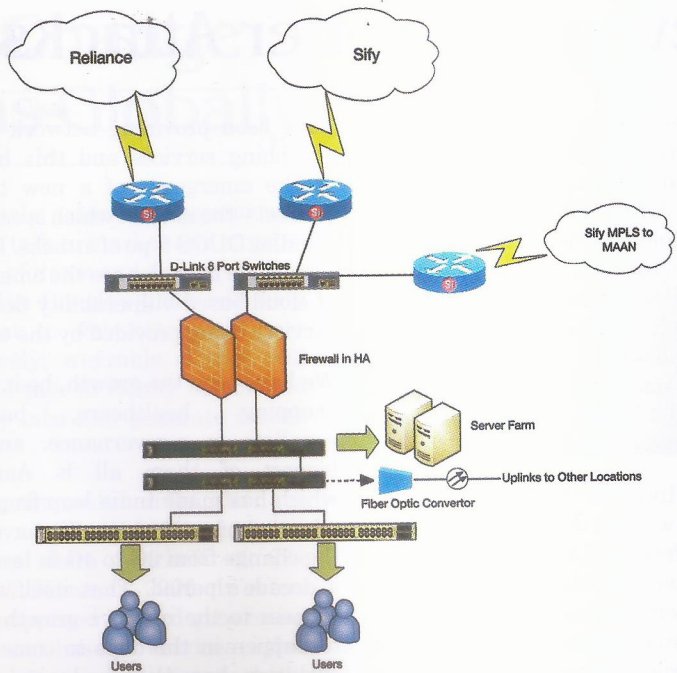
Some of the key points as a network designer in Viraj Profiles Ltd. to consider are:

- **Scalability.** We always collect the overall requirements and also plan the future very carefully. We know that the requirements are very dynamic, for example, in past three months' time, we have stopped buying ordinary 8/12/24-port switches and are looking for managed switch of 48 ports as that gives us better VLAN capability at a given site.

- *Ease-of-use and real-time visibility.* This is the next important consideration as our network team needs to be on their toes for any failure; hence we concentrate on products which mostly have self-diagnostic feature. A web-based console is more useful for deploying and also integrating any network management tool.
- *Vendor consideration.* Over the past two decades, in many places we have deployed network components, which are from various suppliers. Since keeping inventory and maintenance skill is an important consideration, we are now trying to bring in symmetry as much as possible.
- *Consolidation of different tools.* We are in the process of consolidating various network performance-monitoring tools as we have observed that providing different types of tools in different plants is difficult to manage. We are working on a central network management tool and this project will be one of our key projects for ensuring better output.
- *Network security.* We have created a special task force for this. Subsequent to some unpleasant incidences we have realized that we need to take care of different vulnerabilities and also look for not only known attacks but also for unknown occurrences. Viraj Profiles Ltd. is in the process of partnering with Check Point and trying to create a safe network policy. We have also tied up with a leading audit firm to help us find the risks and mitigation plan on a periodic basis. Being a typical manufacturing company, our focus on this area was somewhat kept on the backburner but thanks to the vision of our management team and strong emphasis laid onto it by them, we have now started strengthening this side also of our process.

Looking Three Years down the Line

Since the time we have decided to go for BYOD and many of the applications are constantly being moved on mobility, our responsibility toward a robust IT network has increased. In three more years, when we implement the complete MES, process automation, and IoT deployed in our organization, it will be necessary for us to take care of the networks and selection of components more carefully and we need to create a clear strategy for operation technology (OT) and information technology (IT) networking. We have a plan



A Typical Network Diagram

by middle of next financial year to start a new taskforce to work on this policy and decide the network and components.

In 2017-18, we will concentrate on restructuring our existing network completely and redesign all VLANs, WANs, and MPLs so that more amount of bandwidth is available for use and the breakdowns are limited. We have also been thinking of deploying air fiber for our plants as a second alternative to radio link. While some of us are working on the base line requirement, a separate group is working on strengthening the security aspect of the network.

In 2018-19, we expect to adopt a holistic approach for both OT and IT applications so that the interpretability and integration is easier

As we say, network and communication is a very vast area and we have to augment our knowledge and skill in a continual manner to match up to the expectations of the business to provision adequate resources for their business. We are trying to create an infrastructure and we hope to achieve the goal. As written in first part of this note, our business growth is very fast and the requirement changes are dynamic; our plan and strategy also need to keep pace with the same.