Zinfra

Network Design Proposal

for

Platinum Car and Truck Parts Supply

Prepared on 11/12/2020

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Introduction:-

We Sanchit Mahajan, Krishna Mistry, Haragamveer Singh Matharoo , Ishani Kukadiya, and Harumangveer Singh Matharoo, are the five network specialists at Zinfra. In this report, we have discussed everything regarding our network design proposal for ‘Platinum Cars and Truck Parts Supply’. We have discussed everything from floor layout, logical and physical design to cabling and costing, covering everything required.

Executive Summary

Platinum Car Truck Parts Supply has asked Zinfra to bid on an upcoming network buildout at their new head office. Our proposal includes 11 internal servers, 1 router, 1 core layer switche, 2 distribution layer switches and 11 access switches, one for each department. The total floor area is 1625 sq. m for each floor, totalling 6500 sq m. We have a single Equipment Room and Entrance facility in the IT department, and one Telecommunications Room and TE on each floor to provide network. In terms of cabling, we have used 3 types of cable: multimode fiber, Cat6, and Singlemode fiber. Multimode fiber has been used for backbone cabling, Cat6 to connect TR to ER and single mode fiber to connect TR and TE.

The total acquisition cost will be around $128,393.52 considering all the work-area cabling, horizontal cabling, backbone cabling, core switches, distribution level switches, and access level switches. After that, the yearly maintenance costs will be around $12,891.

Business Profile

Platinum Car and Truck Parts Supply that specializes in warehousing and logistical support, has grown steadily over the last 11 years and now totals over 430 employees who are moving to a new set of offices in a four-floor office into a new suburban office building.

Platinum Car and Truck Parts Supply has determined that the following departments will be located in the new offices:

Department	Size
Operation Staff	143
Inventory Managers	47
Legal	29
Communications	22
Executive Staff	14
Purchasing	35
Finance	52
IT	25
HR	20
Sales and marketing	24
Security	19

The business has identified the following major servers/services:

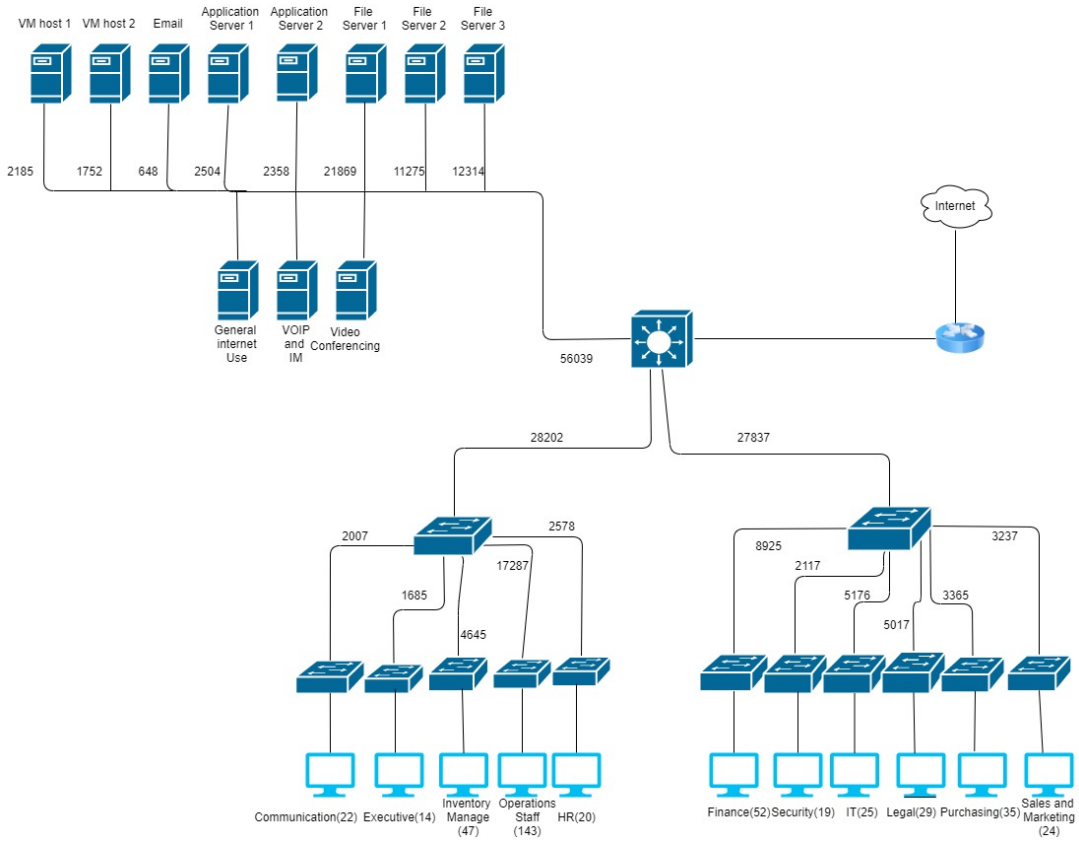
- E-mail
- General Internet use
- **VOIP and IM**
- **VM Host 1**
- VM Host 2
- Application server 1
- Application server 2
- File Server 1

- File server 2
- File server 3

Proposed Logical Network Layout

The following drawings illustrate the proposed logical network for Platinum Car and Truck part supply new offices. It provides a high-level view of the interconnection between workers and their IT infrastructure. includes the number of employees per department (Zinfra) and the resulting bandwidth requirements, and it shows the expected traffic to the Internet and from the end users to the core.

As you can see in the diagram, we have assigned one access layer switch for each department and all these switches connect to a distribution level switch. We have configured the placement of switches to ensure maximum bandwidth balancing. We have 11 internal servers, which are connected to the core switch, just like our distribution layer switches. The core switch is then connected to a router which provides the switch internet. The bandwidths are mentioned in the diagram.

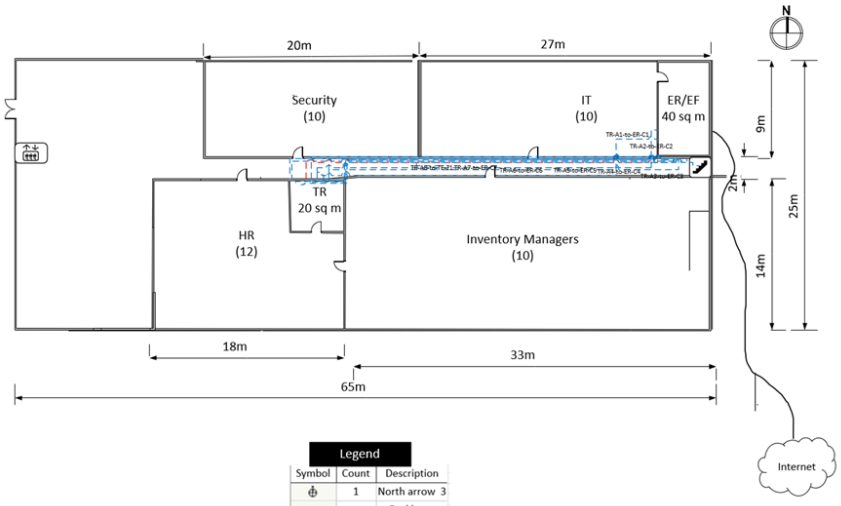


Proposed Physical Network Layout

The following drawings illustrate the proposed physical network layout for Platinum Car and Truck Part Supply new offices. They detail the major cable runs and locations of key IT infrastructure.

For sake of the convenience we have located the Equipment Room and Entrance Facility together in the IT Department. The EF is connected is connected to external walls for the external internet cable to enter the building. Furthermore, the TR is located in a central position for maximum internet coverage. However, in order to provide the best possible range we have also designed a TE on each floor which functions as a smaller version of TR.

In terms of cabling we have used three types of cabling namely multi mode fiber , Cat6 , Single Mode Fiber. We have used multi mode fiber in the backbone Cabling which runs through floor1 to floor 4. We have used multi mode fiber for backbone cabling because it can handle higher data rate due to its core it allows more light to pass through at once. It is more durable than single mode fiber. For connecting the TR to ER we have used Cat6. We have used this because it supports higher data transfer , its internet speed is 250Mhz with less crosstalk and improved insulation. It is also able to handle fast paced gigabit ethernet network. Single mode fiber is used only to connect TR to TE. We have used this here as it lowers the attenuation and create the ability for the signal to travel further.



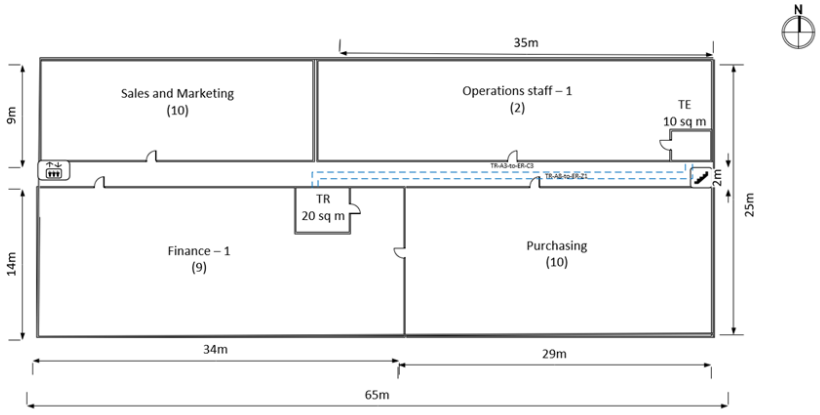
Legend		
Symbol	Count	Description
	1	North arrow 3
	1	Backbone Cabling
	1	Stairs
	2	Cat 6 cable
	1	Elevator

Scale 1cm = 3m

ZINFRA

Floor 1

This is an original drawing created by Sanchit Mahajan, 000819207

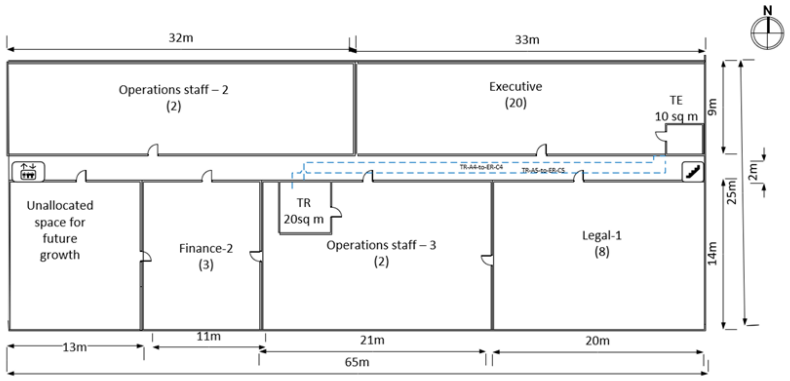


This is an original drawing created by Sanchit Mahajan, 000819207

Scale 1cm = 3m

ZINFRA

Floor 2

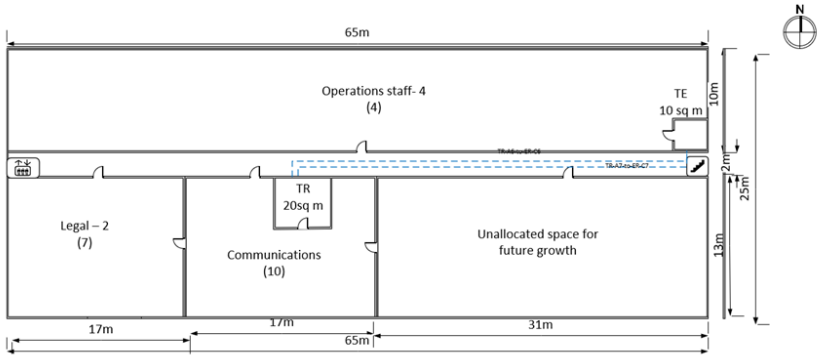


This is an original drawing created by Sanchit Mahajan, 000819207

Scale 1cm = 3m

ZINFRA

Floor 3



This is an original drawing created by Sanchit Mahajan, 000819207

Scale 1cm = 3m

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Floor 4

Cost Estimates

As Platinum Car and Truck parts Supply will be moving into new offices which have suitable wiring closets and plenty of space to run cable, this proposal focuses on hardware and recurring costs to build out the new head office LAN. We have buy one core switch , 2 distribution layer switches and 10 access layer switches and used 10 termination blocks for wire purposes. I have taken 10 access layer switches because to support the distribution layer switches . Total 11779 meter Cat6 , 3006 meter single mode fiber and 5027 meter multi mode fiber is used in this project. Furthermore we have buy one router to connect to the internet.

Buildout and recurring costs have been estimated as follows:

Item	Quantity	Purchase Cost (each)	Monthly Costs	Annual Support Costs (each)	Acquisition Cost	Total Yearly Costs	Supplier	Notes
Internet Connection	1	$ 2,500.00	$ 200.00	$ -	$ 2,825.00	$ 2,712.00	Rogers Business Internet	Includes termination hardw
IPS-SP SVC.AR NBD Cisco catalyst 68	2	$ 11,862.00		$ 1,186.20	$ 26,808.12	$ 2,680.81	Cisco	Management card and suffi
Cisco catalyst 3850 24 port(distribut	2	$ 9,148.43		$ 914.84	$ 20,675.45	$ 2,067.55	Cisco	Stackable (expandable) uni
Catalyst 2960-X 24 GigE POE 370W	10	$ 4,806.08		$ 480.61	$ 54,308.70	$ 5,430.87	Cisco	Includes enough ports for a
110 Termination blocks	10	$ 61.00		$ -	$ 689.30	$ -		
Cat-6 (UTP Category)	11779	$ 0.75		$ -	$ 9,982.70	$ -	Network Distributors	yada
Multi mode fiber (per meter)	5027	$ 0.77		$ -	$ 4,362.63	$ -	Network Distributors	yada
Single mode fiber(per meter)	3006	$ 0.56		$ -	$ 1,902.20	$ -	Network Distributors	yada
Cisco Security 2911(Router)	1	$ 6,052.58		$ -	$ 6,839.42	$ -		
				$ -	$ -	$ -		
				$ -	$ -	$ -		
				$ -	$ -	$ -		
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				$ -	$ -	$ -		

The total acquisition cost of this setup is $ 128,393.52 and total yearly cost is $12,891.23

Additional Comments

We would love to like to hear from you and transform this idea into reality. Kindly reach out to us for any query.

Appendix A – Current Office Layout

The unoccupied offices are made on floor 3 and floor 4 on floor 3 total area of 173sq.m and are on floor 4 is 628sq.m so we have provided the enough space to overall expansion in near future.