Université Constantine 2
جامعة قسنطينة 2

Network Management

– Course 3 –

Chapter 1 : Introduction to Network Management(3/3)

Introduction

Dr. Nadira Benlahrache

NTIC Faculty

email@univ-constantine2.dz

Université Constantine 2
جامعة قسنطينة 2

Network Management

– Course 3 –

Chapter 1 : Introduction to Network Management(3/3)

Introduction

Dr. Nadira Benlahrache

NTIC Faculty

email@univ-constantine2.dz

Concerned Students :

Faculty/Institute	Department	Level	Speciality
NTIC	TLSI	License 3	G.L.

Course objectives

- Present the main protocols used in the field of network administration,
- Present some tools and applications used in this field.
- Concluding Chapter 1

1. Telnet

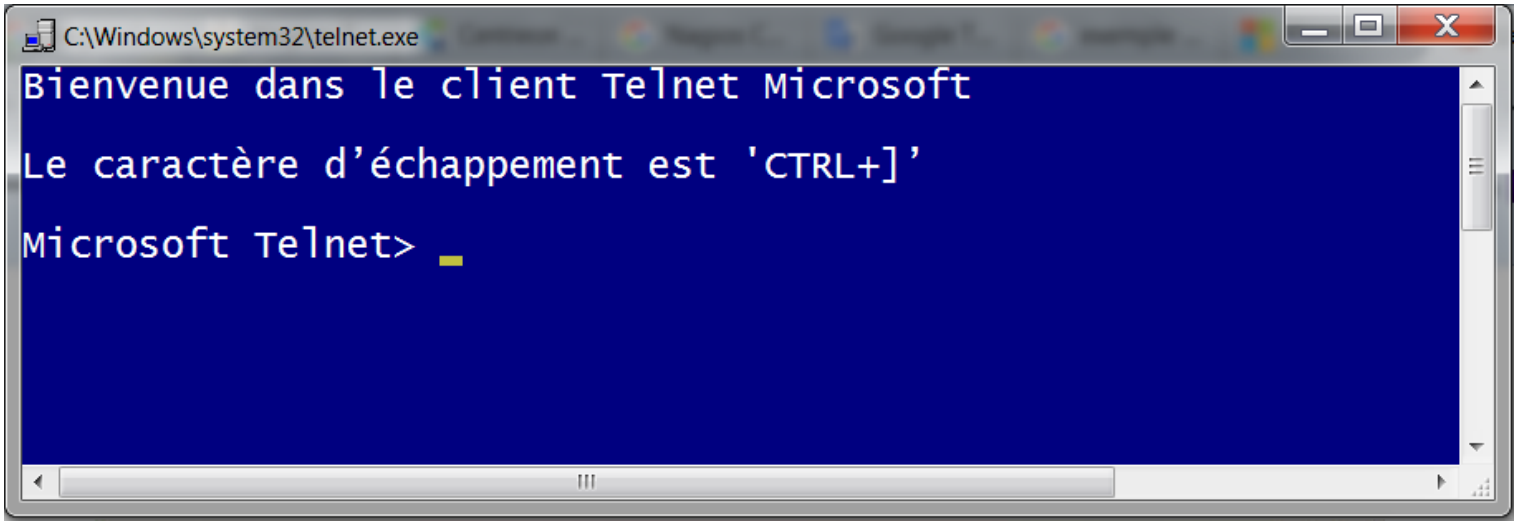
The first historical protocol is Telnet:

- Client Server Mode,
- + Allows you to execute commands entered on the keyboard on a remote machine,
- + Simple to use,
- + Without any particular interface,
- - Transmission in the clear.

1. Telnet

The first historical protocol is Telnet:

- Client Server Mode,
- + Allows you to execute commands entered on the keyboard on a remote machine,
- + Simple to use,
- + Without any particular interface,
- - Transmission in the clear.



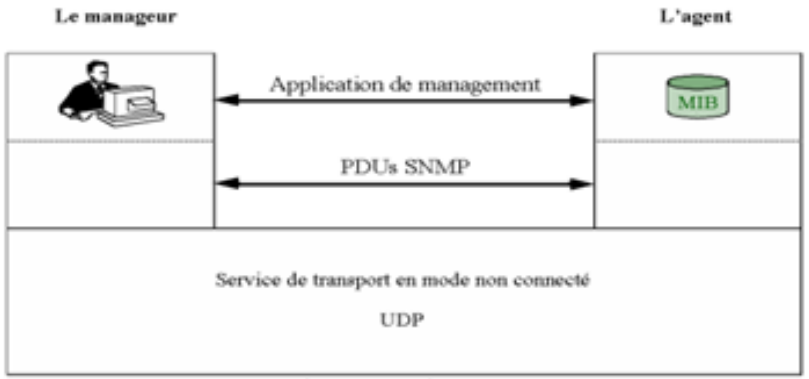
2. Secure Shell (SSH)

- + Telnet Successor,
- + Fixes the security problem by encrypting the transaction via the *Secure Sockets Layer* (SSL) protocol,
- - Interface specific to each hardware,
- - Do not allow parallel transactions.

3. SNMP Protocol

SNMP (**Simple Network Management Protocol**: simplified network management protocol).

- Protocol and environment,
- TCP/IP based: usable for all networks,
- Transaction interface common to all hardware,
- Use of MIB (Module Information Bases) for device variables,
- Hundreds of implementations,
- see: www.net-snmp.org



3. SNMP Protocol

The SNMP protocol has many advantages as a network management tool:

- Network management is done from a **central machine** which is even better for security.
- The **security** has increased during its different versions, until it respects most of the imposed constraints.
- SNMP is used to ensure that requests have **definitely arrived at their destination** and that they have been **correctly interpreted**.
- The use of a **tree structure** for the management of variables makes it possible to have a **continuous evolution** of the functional capacities accessible via this protocol.
- **Management of diversity**: the use of a **standard interface** for all equipment makes it possible to control all network equipment in the same way, which facilitates the management of a computer park, textbfvery diverse

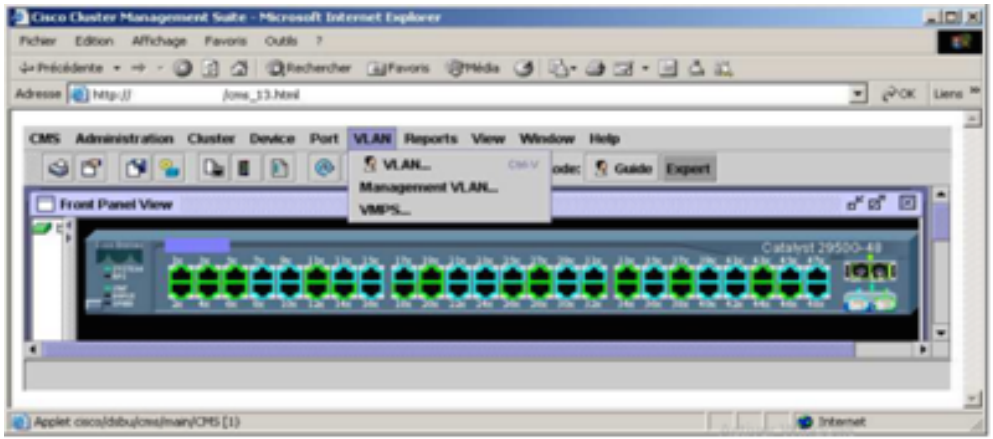
Advantages and Disadvantages of SNMP

- Centralized access
- Security
- Reliability
- Scalability,
- Diversity Management,
- - Very poor communication standard interface and provides little information for management.

WEBM

WEBM (Web-based enterprise management)

- A management solution via the web,
- Based on data modelling: object-oriented CIM (Common information model),
- + Good description of systems: description of devices, memory, processor, applications, operating system, threads, etc.
- - No network management implementation.



Nagios

Nagios®

- *Nagios* is a well-known and free system monitoring solution,
- It allows to monitor the activity of services (MySQL, ftp, http,...) and their hosts, and warn in case of stop or failure,
- He can also discover the network environment and draw a map of it,
- Based on the SNMP protocol,
- - Difficult and complicated configuration.

How Nagios works

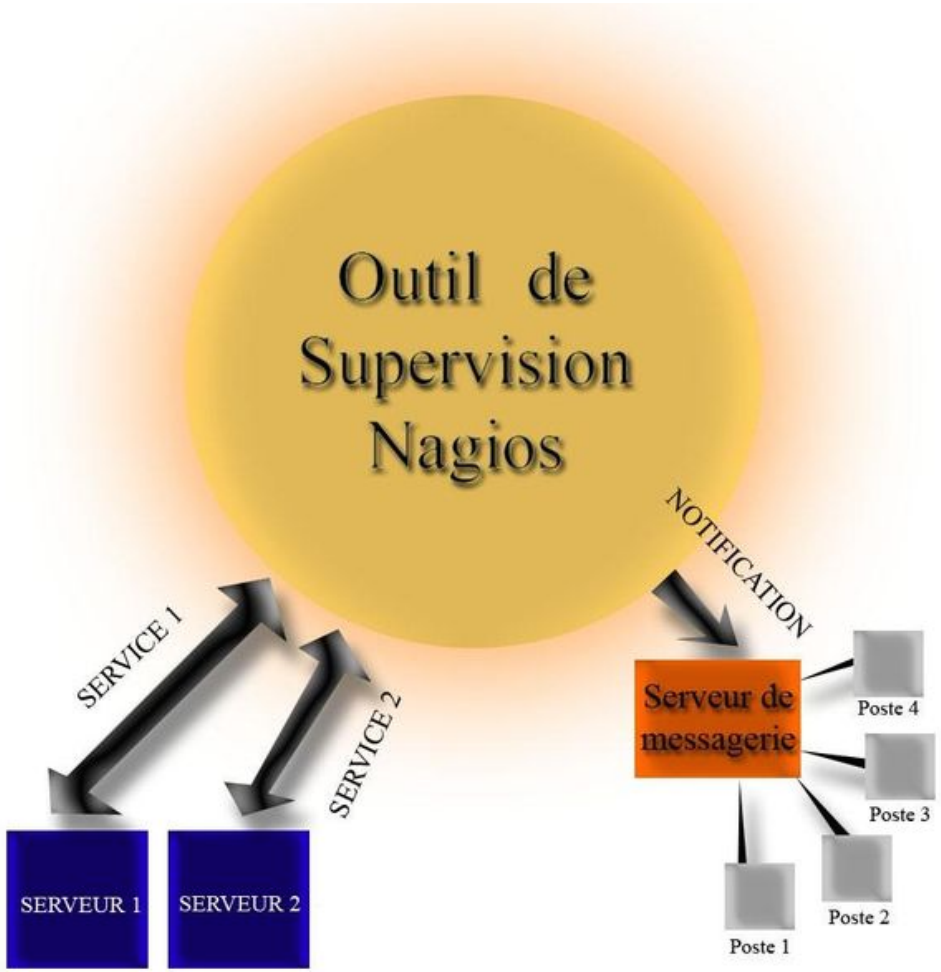


Figure: Operating principle

Centreon

- *Centreon* is the overlay to Nagios,
- Enables easier administration (web interface),
- Better management and usability than Nagios.
- Non-free extensions.

Principle of Operation

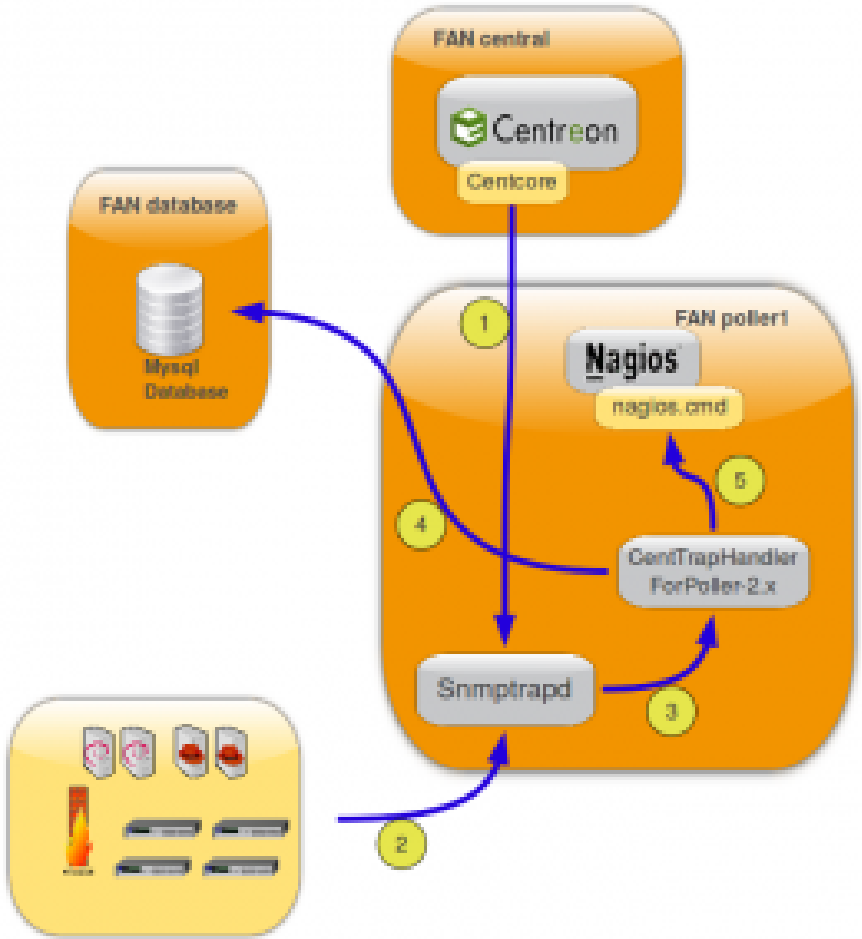


Figure: Centreon Operating principle

Conclusion

The role of a network administrator is to:

- Set up and maintain the **network infrastructure** (organization, ...),
- Install and maintain the**services** necessary for the operation of the network,
- Ensure the **security** of internal network data (particularly against external attacks),
- Manage "**logins**" (i.e. user names, password, access rights, special permissions, ...),
- Manage **shared file systems** and maintain them.

Some useful links

Link 1 :

- http://www.net-snmp.org/

Link 2 :

- https://www.nagios.org/

Link 3 :

- www.centreon.com

References

- D. C. Verma, "Principles of Computer Systems and Network Management", 2010, Springer Science & Business Media.
- A. S. Tannenbaum, "Computer Networks", Prentice Hall.
- J.F. Bouchaudy, "Linux administration, Tome 1: Les bases de l'administration système", Les guides de formation Tsoft, 2014, Eyrolles.