Scalable Distributed Monitoring - Ganglia

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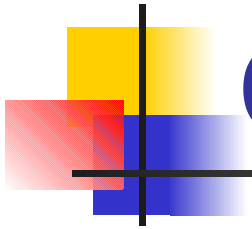


OUTLINE

- INTRODUCTION
- 單一主機之監控
- 分散式監控系統
- Ganglia
- Q & A

INTRODUCTION

- Why Monitoring ???
  - 系統狀態之監控
  - 解決系統之問題
  - 系統或應用程式調校
  - 系統升級時之依據
  - …
- How Monitoring ???
  - 單一主機之監控
  - 分散式監控系統

單一主機之監控

- 要監控哪些資訊？
  - 系統
    - CPU Loading?
    - 記憶體使用量？
    - 硬碟空間？
    - 網路？
    - ....
  - 硬體狀況
    - 電壓？
    - 溫度？

單一主機之監控

- 資訊的來源
  - /proc pseudo file-system
    - 系統核心 (Kernel) 資料
    - 可以供 Kernel 組態調校之參數
  - Basic OS commands
    - ps,free,top,df,dh.....
  - Log files (記載了何時發生了何事)
    - (/var/log/....)

單一主機之監控

- CPU 資訊
  - /proc/cpuinfo
  - /proc/loadavg
    - 系統平均負載
  - uptime

單一主機之監控

- 記憶體資訊
  - /proc/meminfo
  - free
- 硬碟使用狀態
  - df -h
    - 磁碟空間資訊
  - du
    - 目錄

單一主機之監控

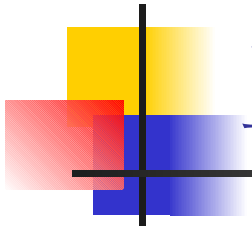
- 綜合性資訊
  - top
  - ps -ef
  - sysstat 套件
    - sar, iostat
  - vmstat
  - netstat

單一主機之監控

- 硬體監控
  - LM sensor
    - sensors-detect
    - sensors
  - IPMI
    - OpenIPMI
    - OpenIPMI-tools

單一主機之監控

- 如何處理資訊
  - 自行撰寫 Shell Scripts
  - 使用現有的工具
    - MRTG
    - RRDTool



工具

- Very important role in monitoring systems has data visualization.
- The most popular tools used for that purpose
  - MRTG (http://oss.oetiker.ch/mrtg/)
    - 最多可以在一張圖上表現出兩種資料
    - http://www.tcc.edu.tw/netbase/mrtg/
  - RRDTool (http://oss.oetiker.ch/rrdtool/)
    - 可同時呈現多種資料

分散式監控系統

- 監控的機器數目增加 .....
- Distributed concept demands employment of monitored data for efficient job distribution

分散式監控系統

- 構成元件
  - daemons that reside on cluster nodes
  - server that collects cluster state information from nodes
  - GUI-based front-end, which provides system activity visualization
- The most prominent cluster monitoring systems are Ganglia, Supermon and Hawkeye.

Ganglia (神經元 ?)

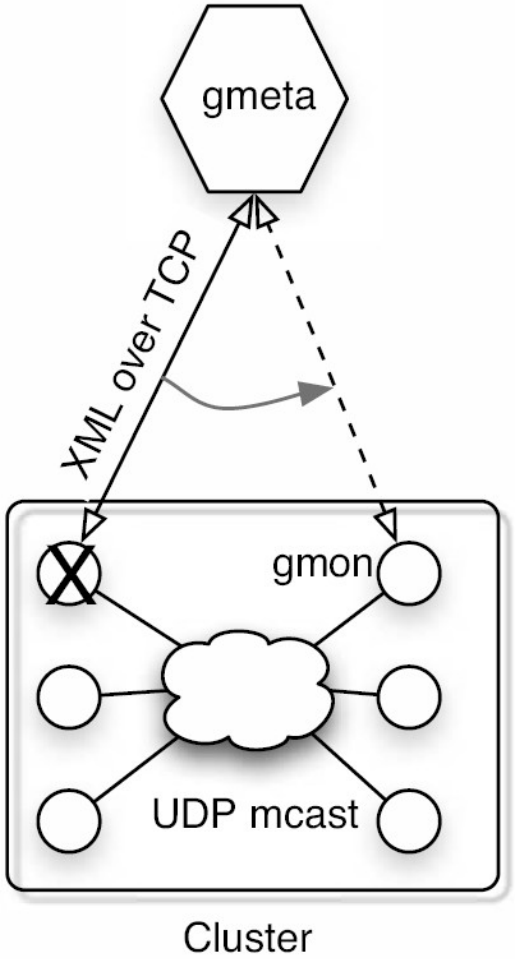
- A scalable distributed monitoring system for high-performance computing systems such as clusters and Grids.
- Version 3.0.1
- Technologies
  - XML
  - RRDtool

Ganglia (神經元 ?)

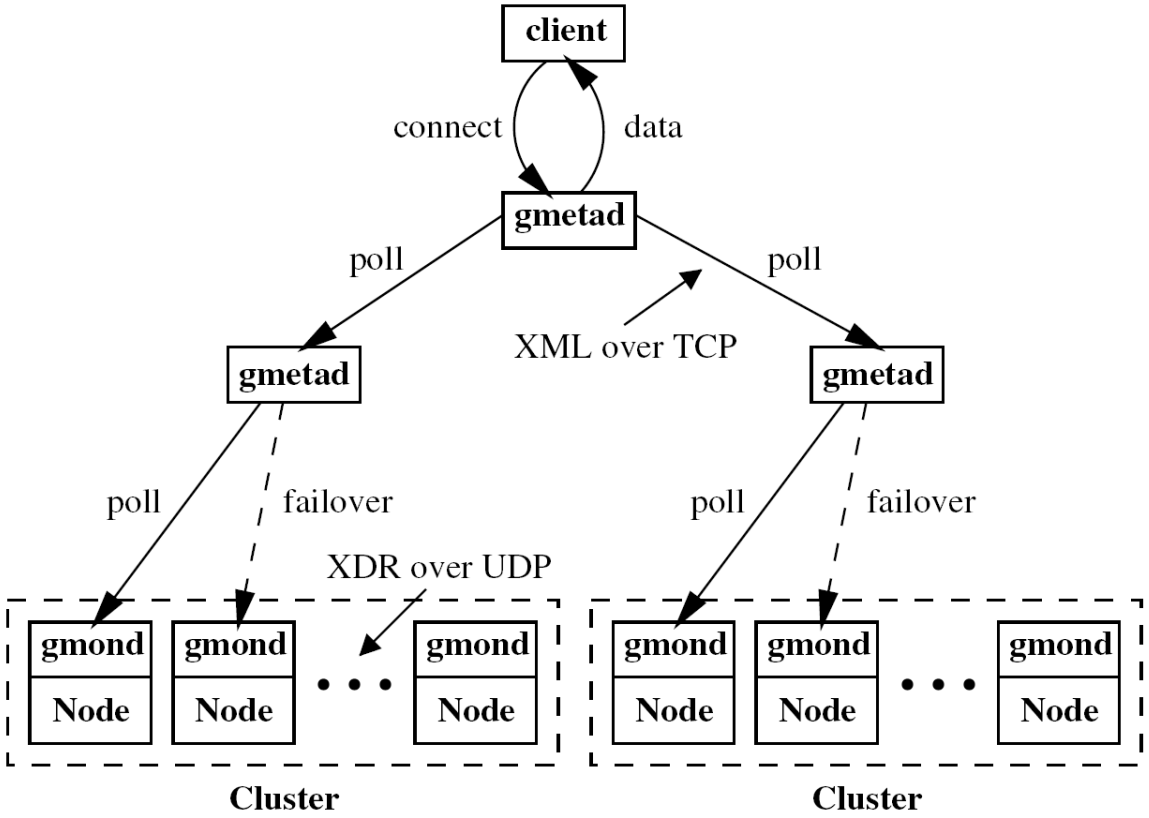
- Low per-node overheads
- High concurrency
- System component
  - Ganglia Monitoring Daemon (gmond)
  - Ganglia Meta Daemon (gmetad)
  - Ganglia PHP Web Frontend

Ganglia local and wide area monitor interaction.

Gmon runs on each cluster node; gmeta can fail over between nodes.

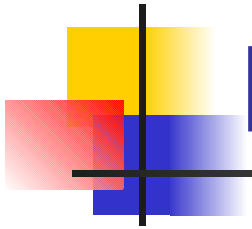


Ganglia architecture



Source

- Pre-Installation
  - PHP--http://www.php.net/ (--with-gd)
  - APACHE--http://www.apache.org/
  - RRDTOOLS--http://www.rrdtool.com/
- Monitoring Core Installation
  - ganglia-monitor-core-3.0.1.tar.gz (http://ganglia.sourceforge.net)
  - ganglia_pbs.tar.gz (ftp://ftp.sara.nl/pub/outgoing)
  - pbs_python.tar.gz (ftp://ftp.sara.nl/pub/outgoing)

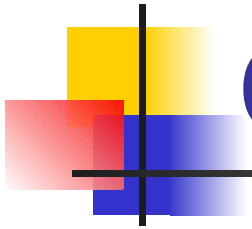


Post-Install

- Configure file
  - /ect/gmond.conf
  - /etc/gmetad.conf
  - /usr/local/apache/htdocs/ganglia/conf.php

自行定義 Ganglia

- 收集資訊 Shell Script
- 以 gmetric 將資訊放入 ganglia 中
  - gmetric -t type -n name -u unit -v value
- 固定時間重複第一步



Q & A