

# GNU FreeIPMI Hackers Meet 2005

## **GNU FreeIPMI Project**

**Anand Babu** <*ab@zresearch.com*>

**FreeIPMI Core Team**

# Session I

- IPMI 1.5 / 2.0
- Introduction to GNU FreeIPMI
- Z RESEARCH's Commitment
- Hardware Compliance
- GNU FreeIPMI at LLNL as Example
- Software License: GNU GPL v2 or Later
- Demo Session – SR870BN4 Quad Itanium2

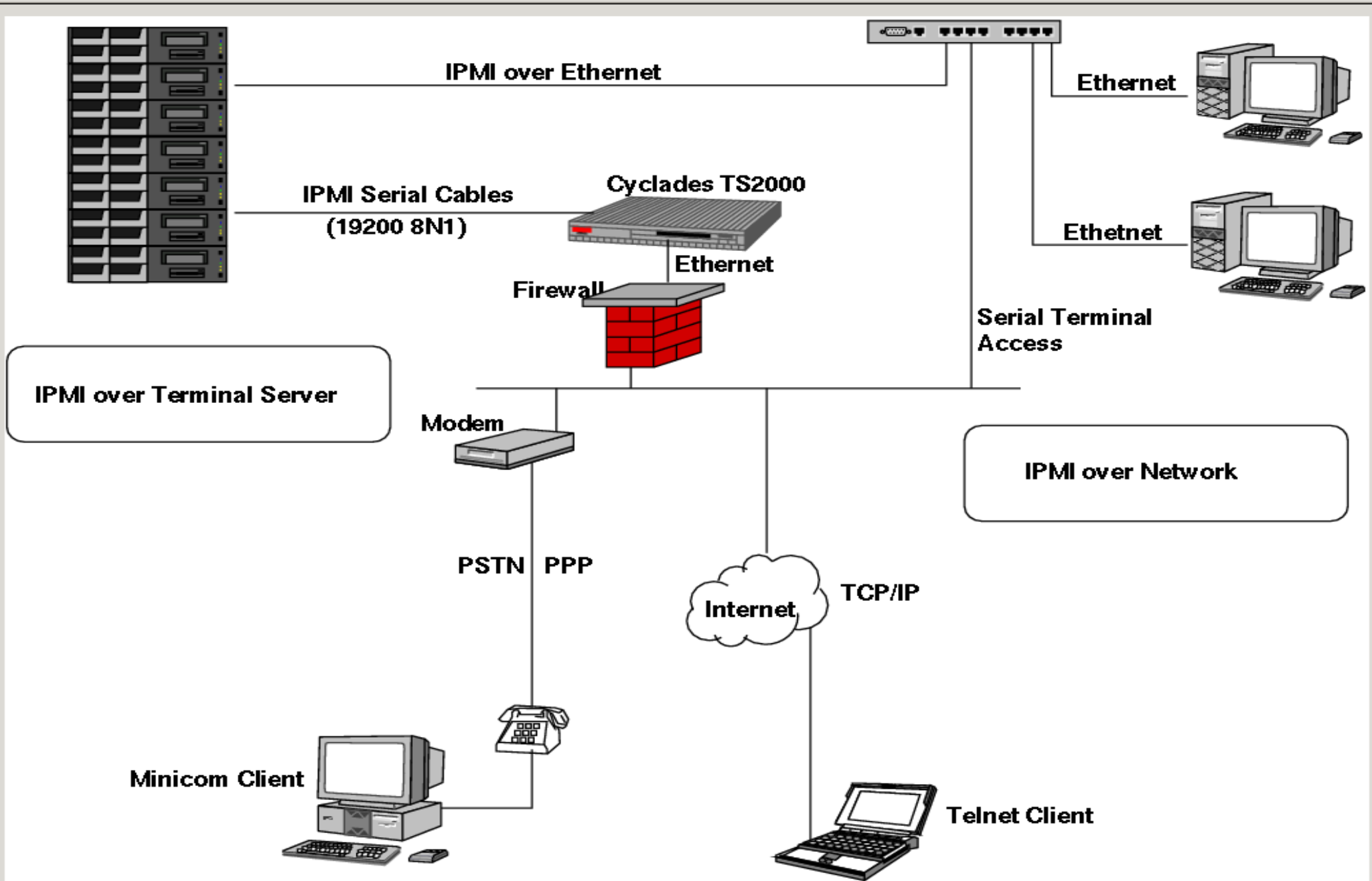
# Session II

- Hacking GNU FreeIPMI
- Preparing for 0.2.0 Release
- Plans for 0.3.0 Release
- Free Software Community and Third Party
- Architecture Discussion
- Project Management and Source Organization

# IPMI

- Platform Management
- Industry Standard IPMI
- 1.5 and 2.0 Specification
- Future of IPMI

# IPMI Network Layout



# Introduction to GNU FreeIPMI

- What is GNU FreeIPMI
- History of GNU FreeIPMI
- GNU FreeIPMI Components
- Current Status

# GNU FreeIPMI Components

- **KCS, SMIC, SSIF, LAN and probing drivers**
- **libfreeipmi** - C library interface
- **fish** - Scheme extensible, readline based IPMI shell.
- **ipmi-power** - Power Management utility
- **ipmi/rmcp-ping** - IPMI Discovery and Reachability
- **ipmi-sensors** - Monitoring and Diagnostics utility
- **bmc-config[-auto]** - IPMI Configurator
- **ipmi-sel** - System Event Log utility
- **ipmi-sold** – IPMI SOL Daemon (*IPMI-2.0 onwards*)
- **bmc-info** - BMC Version, Features

# Z RESEARCH's Commitment

- VA Linux -> CaliforniaDigital -> Z RESEARCH
- Continued commitment / collaboration with the Free Software Community
- GNU FreeIPMI in Gluster Project
- Commercial backing and Support

# LLNL and IPMI

## Transfer to *Albert Chu*

- GNU FreeIPMI at LLNL
- Thunder by Example
- Future Plans

# Hardware Compliance

- Firmware Correctness
- GNU FreeIPMI Certification
- Compliance Test Utility
- Reporting on the mailing list
- Cooperation with the Free Software Community

# Software License

- GNU GPL V2 or Later
- Lesser GPL ???

# Demo Session

- SR870BN4 – Quad Itanium2 System
  - IPMI 1.5
  - Debian GNU/Linux OS
  - Demo by Balamurguan

# Design Goals

**Performance**

**Completeness**

**Portability**

**Correctness**

# GNU FreeIPMI Stack

ipmi-sensors, bmc-config,  
bmc-info, ipmi-sel, discovery

ipmipower, bmc-watchdog,  
ipmi-ping, rmcp-ping

Shell

Extension

Scripting

FreeIPMI Shell (fish)

SEL, SDR, FRU, PEF, Chassis, IPM Device Global,  
Messaging Support, LAN, Serial/Modem

LAN

KCS

SMIC

FreeIPMI “C Library”



# Desecting “libfreeipmi”

- Architecture
- Unified Driver Model
- Example Code - utm-test.c
- Debugging Techniques

# Locking, Synchronization

- Semaphores
- Per Command Transaction
- Handled inside the device driver

# Interface Definition

- FIID (FreeIPMI Interface Definition)
  - fiid\_obj\_alloc
  - fiid\_obj\_len
  - fiid\_obj\_field\_lookup
  - fiid\_obj\_get
  - fiid\_obj\_set

# Sample FIID

```
fiid_template_t tpl_get_sel_info_rs =
{
    {8,  "cmd"},
    {8,  "comp_code"},
    {4,  "sel_version_major"},
    {4,  "sel_version_minor"},
    {16, "log_entry_count"}, //LS byte first
    {16, "free_space"}, //LS byte first
    {32, "recent_addition_timestamp"}, //LS byte first
    {32, "recent_erase_timestamp"},
    {1,  "get_sel_alloc_info_cmd_support"},
    {1,  "reserve_sel_cmd_support"},
    {1,  "partial_add_sel_entry_cmd_support"},
    {1,  "delete_sel_cmd_support"},
    {3,  "reserved"},
    {1,  "overflow_flag"},
    {0,  ""}
};
```

# FreeIPMI SShell

- Shell Interface
- Customization
- Extension
- Scripting

# FISHing

```
:: fish.scm: default fish configuration scm
```

```
:: Customize Fish:
```

```
(fi-set-prompt! "fish# ")
```

```
:: Set driver SMS IO Base port
```

```
; (fi-set-sms-io-base! #x0CA2)
```

```
:: Set Driver Internals:
```

```
; (fi-set-default-driver-poll-interval 10)
```

```
:: Example Group Aliases
```

```
; (set! sensors-group-alias-list
```

```
; '(  
;   (mysystem . (Processor Fan "Power Supply" Current Memory Chassis))  
;   (power . ("Power Supply"))  
;   (security . ("Platform Chassis Intrusion Platform Security Violation"))  
;   ))
```

# Preparing 0.2.0 Release

- Whats new in 0.2.0
- Unified Driver Model
  - Theory
  - APIs
  - Thread Safety
  - Sequencing Packet Retries and Connection State
  - Locking and Synchronization
- Hardware Probing
- IPMI Sensors APIs
- Automated Configuration
- Pending Tasks and Release Date

# Plans for 0.3.0 Release

- IPMI 2.0 Standards
- SOL
- FIID Enhancements
- Multi-host LAN Configuration
- Intel Active Management Technology
- Other Emerging Standards
- Ease of Use (Curses, GTK+, PHP??)
- Roadmap

# Collaboration with the community

- Merging, Integration and Collaboration with other projects
- Common Headers and Libraries
- Vendor Involvement

# Project Management

- CVS and Source Reorganization
- Release Management

# Contact us

- Home Page
  - <http://www.gnu.org/software/freeipmi>
- Project Page
  - <https://savannah.gnu.org/projects/freeipmi/>
- Mailing List
  - <https://savannah.gnu.org/mail/?group=freeipmi>
- Contact Me
  - Anand Babu <[ab@zresearch.com](mailto:ab@zresearch.com)>