The Crimson SNMP Driver

What Is SNMP?

- SNMP is the Simple Network Management Protocol.
- It is most certainly not simple!
- But it is the *lingua franca* of the IT management world.
- Crimson now supports read-only access via SNMP.
- This allows industrial data to be accessed by IT systems.
- We are an *SNMP Agent*, or what we would call a *slave*.
- We are accessed by an *SNMP Manager*.

How SNMP Organizes Data

- SNMP groups data into *Management Information Blocks* (MIBs).
- Each MIB is specified via a text file known as the *MIB File*.
- The file defines data layout and naming for the Manager.
- Fundamental data types include integers, string etc.
- These can be grouped together to form complex types.
- Complex types can contain other complex types.
- Complex types can be listed in tables.

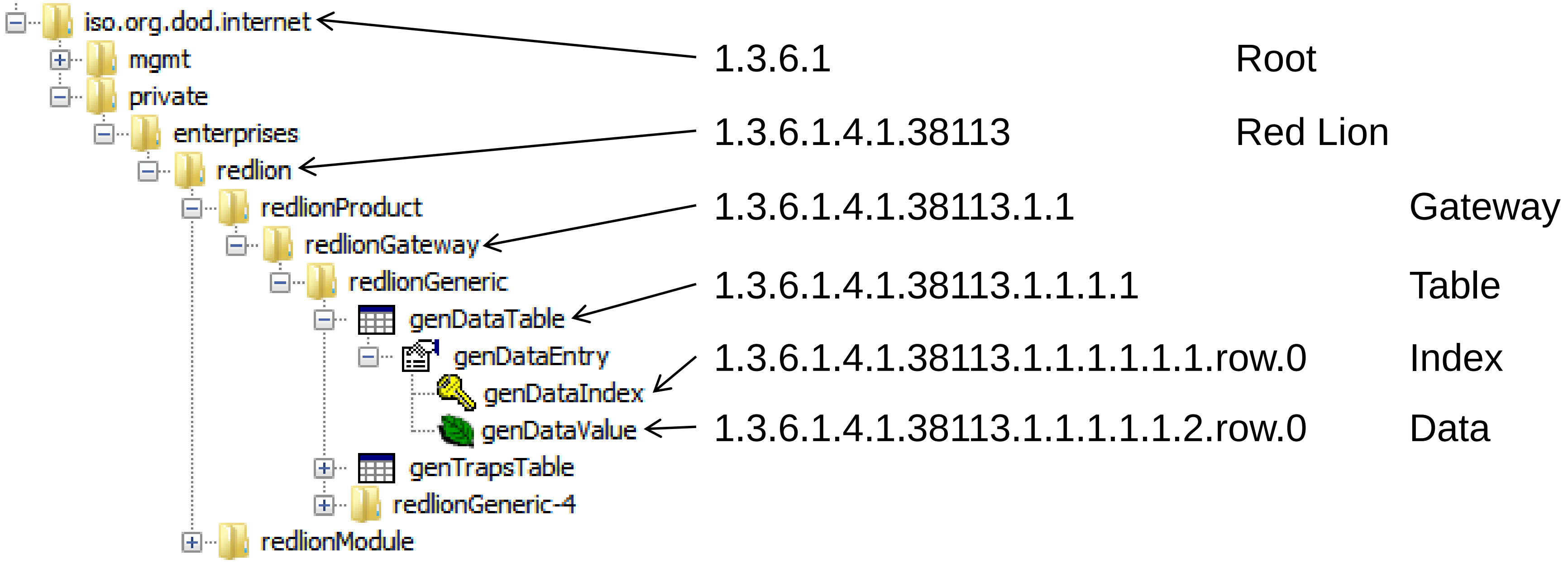
What MIBs Do We Support?

- Standard types describe Ethernet ports etc.
- The collection of standard types is published in *MIB-II*.
- Red Lion does not support access to MIB-II data.
- So you cannot manage our IP stack via SNMP.
- We do support access via a specific Red Lion MIB.
- This MIB contains a table of up to 999 integer values.

Lots of Dots

- Items within MIBs are named using *Object Identifiers* (OIDs).
- OIDs are very long series of dots and numbers.
- OIDs are unique and support delegated allocation.
- The OID 1.3.6.1.4.1.38113 is allocated to Red Lion Controls
- And we own everything that starts with this sequence.
- For example, 1.3.6.1.4.1.38113.1.1.1.1 is our generic data table.
- OIDs can be considered to be arranged in a tree.

Lots of Dots

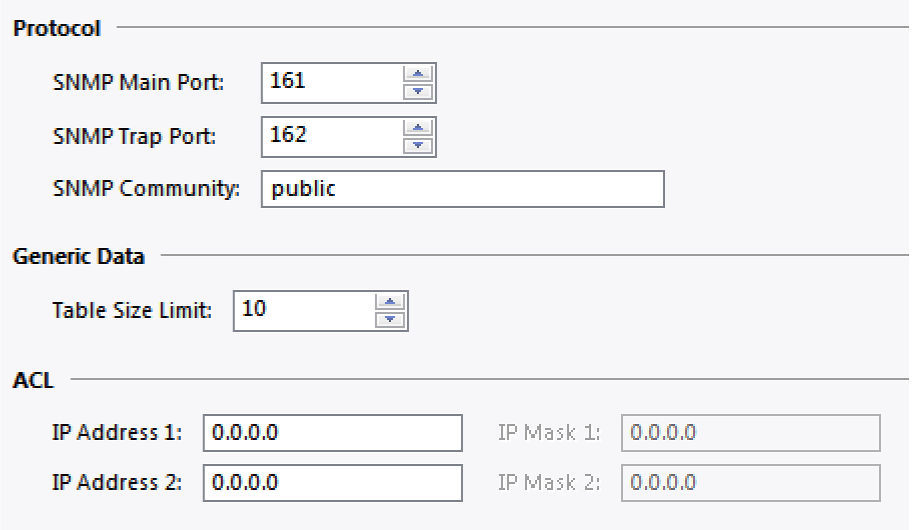


- iso.org.dod.internet
  - mgmt
  - private
    - enterprises
      - redlion
        - redlionProduct
          - redlionGateway
            - redlionGeneric
              - genDataTable
                - genDataEntry
                  - genDataIndex
                  - genDataValue
              - genTrapsTable
              - redlionGeneric-4
        - redlionModule

1.3.6.1	Root
1.3.6.1.4.1.38113	Red Lion
1.3.6.1.4.1.38113.1.1	Gateway
1.3.6.1.4.1.38113.1.1.1.1	Table
1.3.6.1.4.1.38113.1.1.1.1.1.1.row.0	Index
1.3.6.1.4.1.38113.1.1.1.1.1.2.row.0	Data

- SNMP uses the *Get-Next* command to walk this tree.
- The *Get-Bulk* command reads multiple items at a time.

Setting Up The Driver



Protocol

SNMP Main Port: 161

SNMP Trap Port: 162

SNMP Community: public

Generic Data

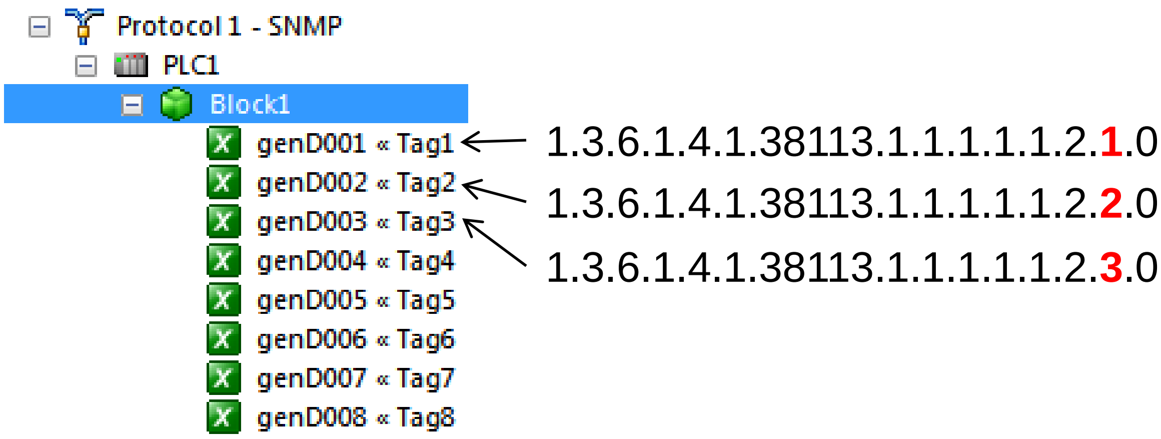
Table Size Limit: 10

ACL

IP Address 1:	0.0.0.0	IP Mask 1:	0.0.0.0
IP Address 2:	0.0.0.0	IP Mask 2:	0.0.0.0

- Protocol settings can typically be left at defaults.
- Table Size Limit speeds up whole-table read operations.
- ACL entries limit acceptable source IPs of requests.

Setting Up Mappings



- Protocol 1 - SNMP
  - PLC1
    - Block1
      - genD001 « Tag1
      - genD002 « Tag2
      - genD003 « Tag3
      - genD004 « Tag4
      - genD005 « Tag5
      - genD006 « Tag6
      - genD007 « Tag7
      - genD008 « Tag8

1.3.6.1.4.1.38113.1.1.1.1.1.2.1.0

1.3.6.1.4.1.38113.1.1.1.1.1.2.2.0

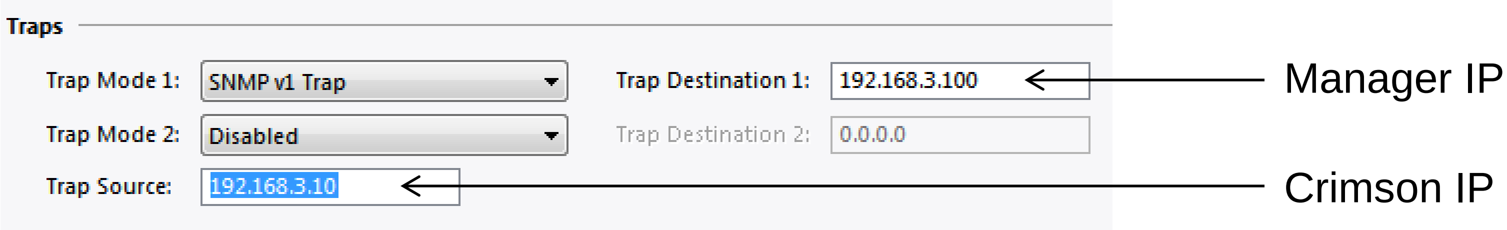
1.3.6.1.4.1.38113.1.1.1.1.1.2.3.0

- The gateway block is nearly always mapped to genD001.
- This corresponds to the first entry in the data table.
- Block size should not exceed limit in the driver settings!

Using Traps

- *Traps* tell the Manager something changed in the Agent.
- We support *SNMP v1* traps via a secondary data table.
- When an entry changes to or from zero, we send a trap.
- We will always send all configured traps on power-up.
- Traps are not acknowledged. They are fire-and-forget.
- Traps can be sent to two distinct target IPs.
- The trap source IP must be configured manually.

Setting Up Traps



Traps

Trap Mode 1: SNMP v1 Trap

Trap Mode 2: Disabled

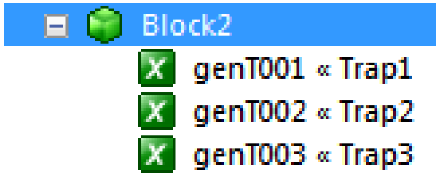
Trap Source: 192.168.3.10

Trap Destination 1: 192.168.3.100

Trap Destination 2: 0.0.0.0

Manager IP

Crimson IP



Block2

- genT001 « Trap1
- genT002 « Trap2
- genT003 « Trap3

- Each tag above will fire a specific trap on a transition.
- Traps are sampled at most every 250ms.
- Trap source OIDs are 1.3.6.1.4.1.38113.1.1.1.2.1.2.row.0
- Remember traps are not acknowledged or resent!

Summary

- Crimson now supports SNMP read-only data access.
- We do not support MIB-II and cannot be managed.
- But we can expose industrial data to SNMP Managers.
- We support up to 999 integer data values.
- We support up to 999 SNMP v1 traps.

THANK YOU!