

SERVICE MAPPINGS

This memo describes the relationship between the Internet Protocol (IP) [1] Type of Service and the service parameters of specific networks.

The IP Type of Service has the following fields:

Bits 0-2: Precedence.
Bit 3: 0 = Normal Delay, 1 = Low Delay.
Bits 4: 0 = Normal Throughput, 1 = High Throughput.
Bits 5: 0 = Normal Reliability, 1 = High Reliability.
Bit 6-7: Reserved for Future Use.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|------------|---|---|---|---|---|---|---|
| PRECEDENCE | | | D | T | R | 0 | 0 |

111 - Network Control
110 - Internetwork Control
101 - CRITIC/ECP
100 - Flash Override
011 - Flash
010 - Immediate
001 - Priority
000 - Routine

The individual networks listed here have very different and specific service choices.

AUTODIN II

The service choices are in two parts: Traffic Acceptance Categories, and Application Type. The Traffic Acceptance Categories can be mapped into and out of the IP TOS precedence reasonably directly. The Application types can be mapped into the remaining IP TOS fields as follows.

| TA | DELAY | THROUGHPUT | RELIABILITY |
|-----|-------|------------|-------------|
| --- | --- | ----- | ----- |
| I/A | 1 | 0 | 0 |
| Q/R | 0 | 0 | 0 |
| B1 | 0 | 1 | 0 |
| B2 | 0 | 1 | 1 |

| DTR | TA |
|-----|-------|
| --- | --- |
| 000 | Q/R |
| 001 | Q/R |
| 010 | B1 |
| 011 | B2 |
| 100 | I/A |
| 101 | I/A |
| 110 | I/A |
| 111 | error |

ARPANET

The service choices are in quite limited. There is one priority bit that can be mapped to the high order bit of the IP TOS precedence. The other choices are to use the regular ("Type 0") messages vs. the uncontrolled ("Type 3") messages, or to use single packet vs. multipacket messages. The mapping of ARPANET parameters into IP TOS parameters can be as follows.

| Type | Size | DELAY | THROUGHPUT | RELIABILITY |
|------|------|-------------|------------|-------------|
| ---- | ---- | ----- | ----- | ----- |
| 0 | S | 1 | 0 | 0 |
| 0 | M | 0 | 0 | 0 |
| 3 | S | 1 | 0 | 0 |
| 3 | M | not allowed | | |

| DTR | Type | Size |
|-----|-------|------|
| --- | ---- | ---- |
| 000 | 0 | M |
| 001 | 0 | M |
| 010 | 0 | M |
| 011 | 0 | M |
| 100 | 3 | S |
| 101 | 0 | S |
| 110 | 3 | S |
| 111 | error | |

PRNET

There is no priority indication. The two choices are to use the station routing vs. point-to-point routing, or to require acknowledgments vs. having no acknowledgments. The mapping of PRNET parameters into IP TOS parameters can be as follows.

| Routing | Acks | DELAY | THROUGHPUT | RELIABILITY |
|---------|------|-------|------------|-------------|
| ----- | ---- | ----- | ----- | ----- |
| ptp | no | 1 | 0 | 0 |
| ptp | yes | 1 | 0 | 1 |
| station | no | 0 | 0 | 0 |
| station | yes | 0 | 0 | 1 |

| DTR | Routing | Acks |
|-----|---------|------|
| --- | ----- | ---- |
| 000 | station | no |
| 001 | station | yes |
| 010 | station | no |
| 011 | station | yes |
| 100 | ptp | no |
| 101 | ptp | yes |
| 110 | ptp | no |
| 111 | ptp | yes |

SATNET

There is no priority indication. The four choices are to use the block vs. stream type, to select one of four delay categories, to select one of two holding time strategies, or to request one of three reliability levels. The mapping of SATNET parameters into IP TOS parameters can thus quite complex there being $2*4*2*3=48$ distinct possibilities.

References

- [1] Postel, J. (ed.), "Internet Protocol - DARPA Internet Program Protocol Specification," RFC 791, USC/Information Sciences Institute, September 1981.

