



I E T F[®]

BRDP based Address Autoconfiguration

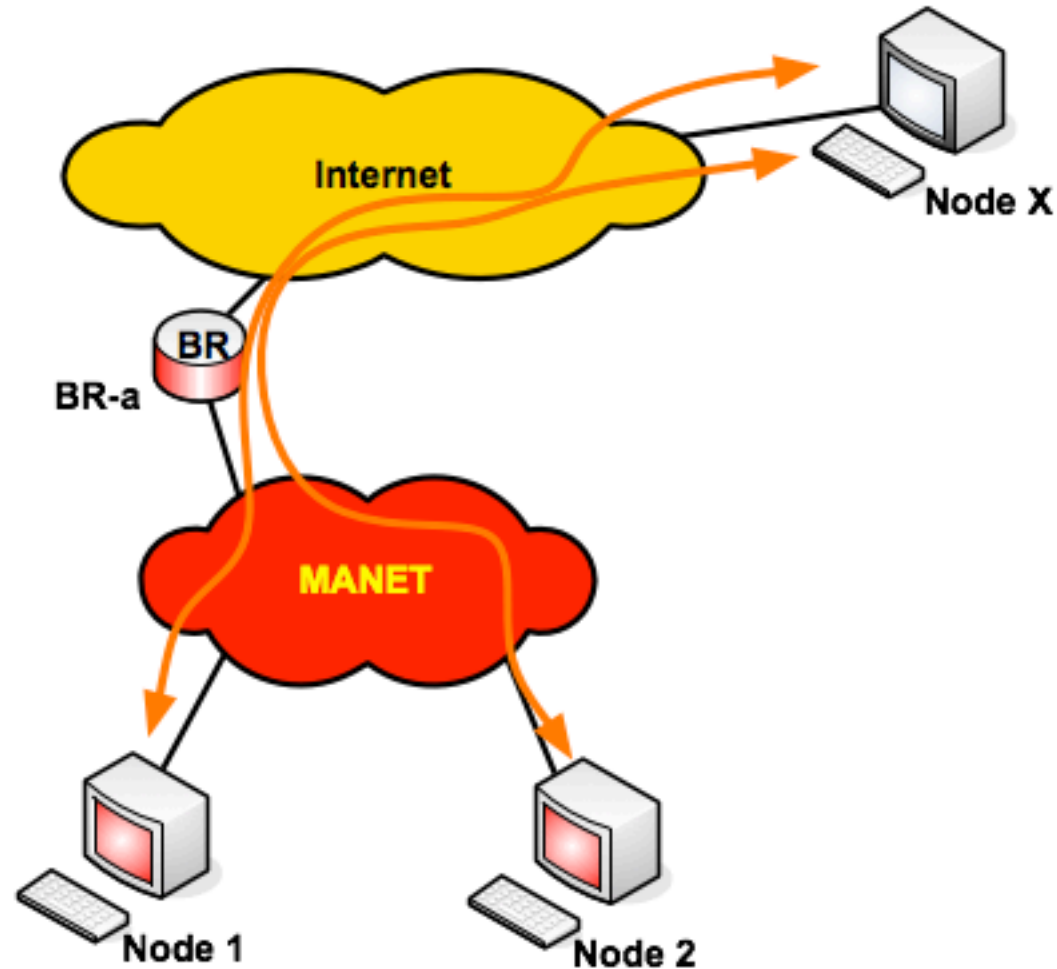
Teco Boot - IETF-77 - March 26th 2010

Ad-Hoc Network Autoconfiguration (autoconf)

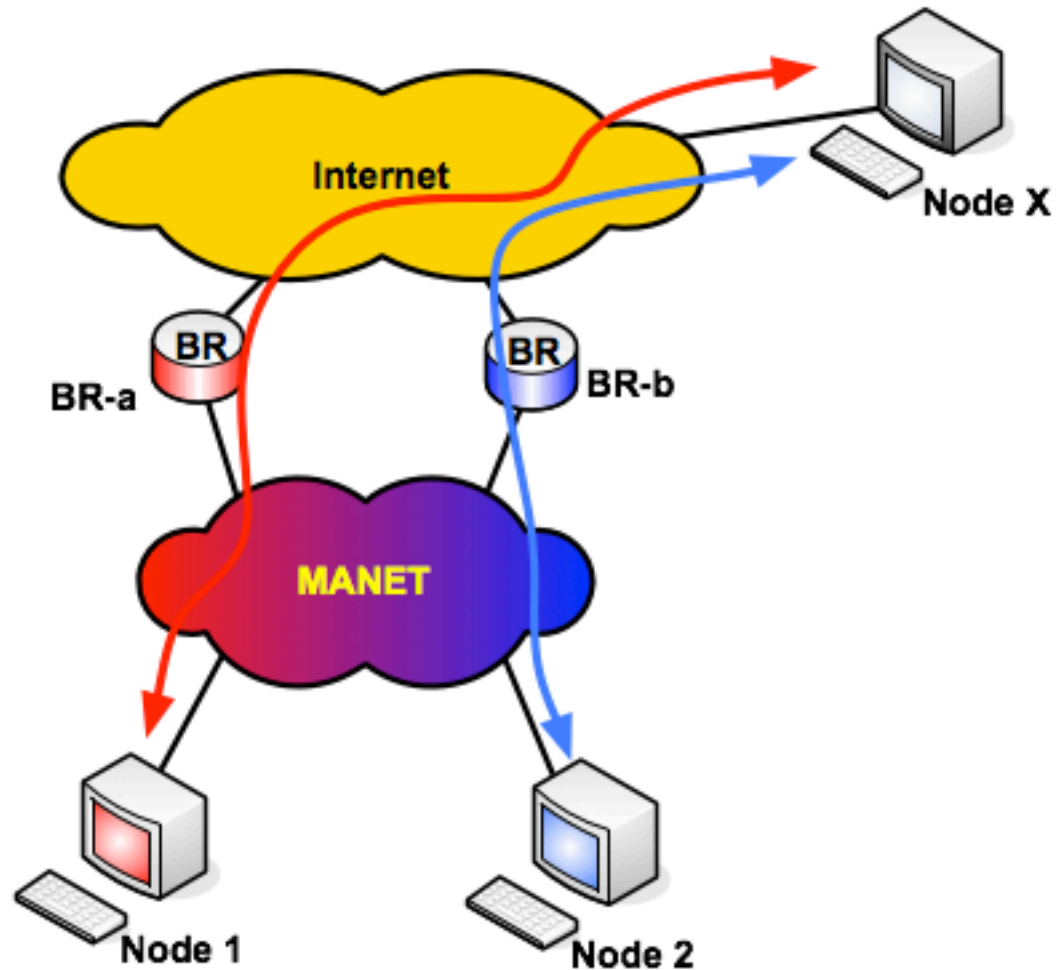
History and status

- ❖ Finding solutions for scalable MANETs by using a backbone
- ❖ MANETs connected to the Internet have their problems:
 - Getting global addresses
 - Multi-homing with ingress filtering
- ❖ Started with attempt to combine MANET and NEMO technology (e.g. MANEMO). Now, the NEMO part is removed.
- ❖ Based on Tree Discovery for scoped flooding
 - Now, we have this function in RPL (Roll)
 - Obvious choice to line up with RPL (not decided yet)
- ❖ Implemented in Opnet (basics)

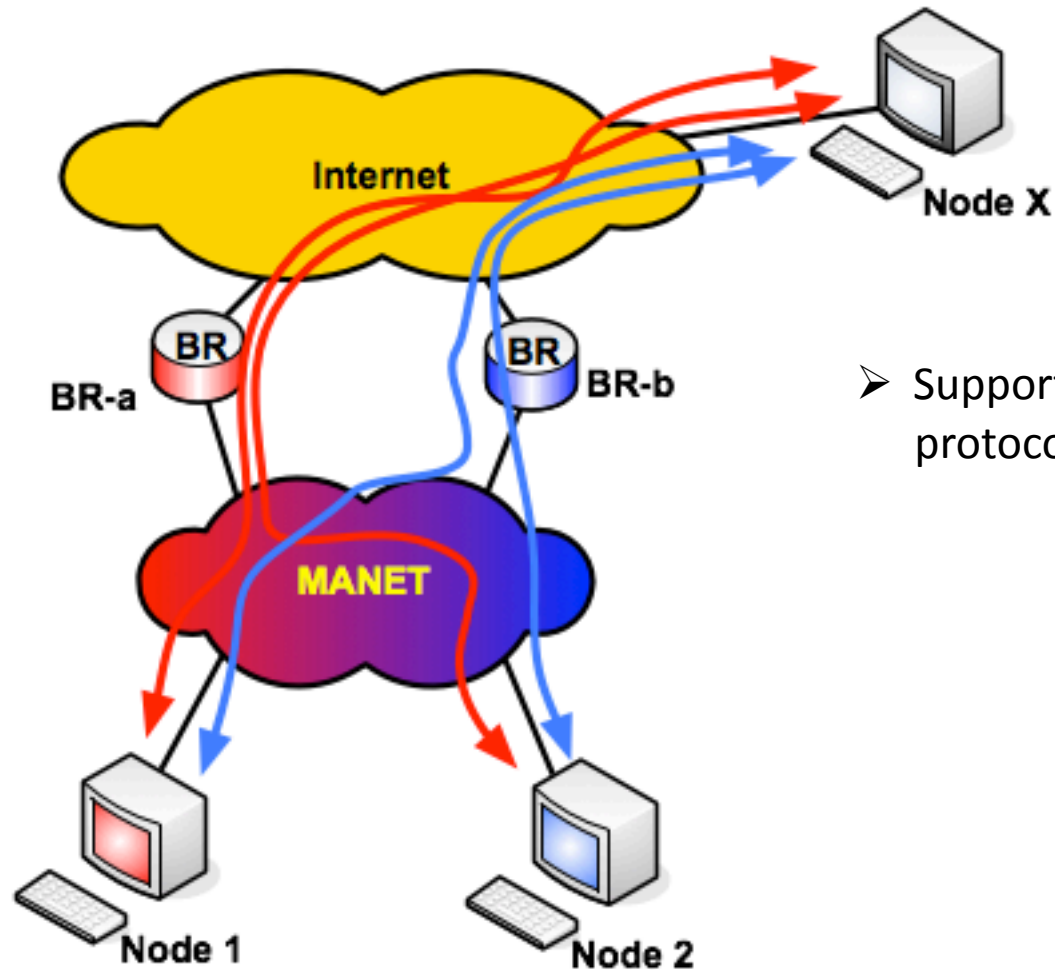
Scenario 1: Single-homed MANET



Scenario 2: Multi-homed MANET



Scenario 3: Multi-homed MANET nodes



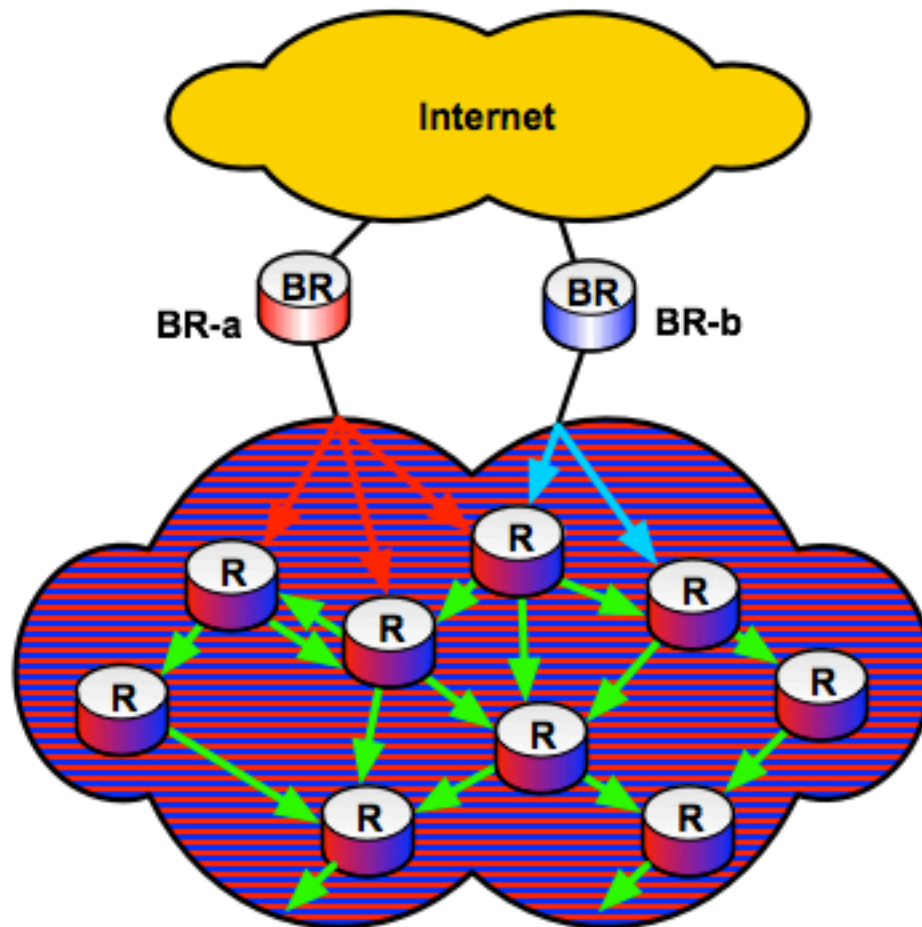
- Support for multi-path transport protocols, MIP6 etc.

How does it work?

Border Router Discovery Protocol (BRDP):

- **Distributes Border Router Information Option (BRIO) via Neighbor Discovery Router Advertisements**
- **BRIOs provide prefix information to interior nodes**
- **BRIOs are distributed in the MANET using scoped flooding**
- **BRIOs provide metrics for address selection**
 - **Assumption: Address selection == Border Router selection == Path selection from and to DFZ**
- **BRIOs provide DHCP (relay) information, for getting additional parameters, using unicast**

BRDP BRIO flooding without scoping



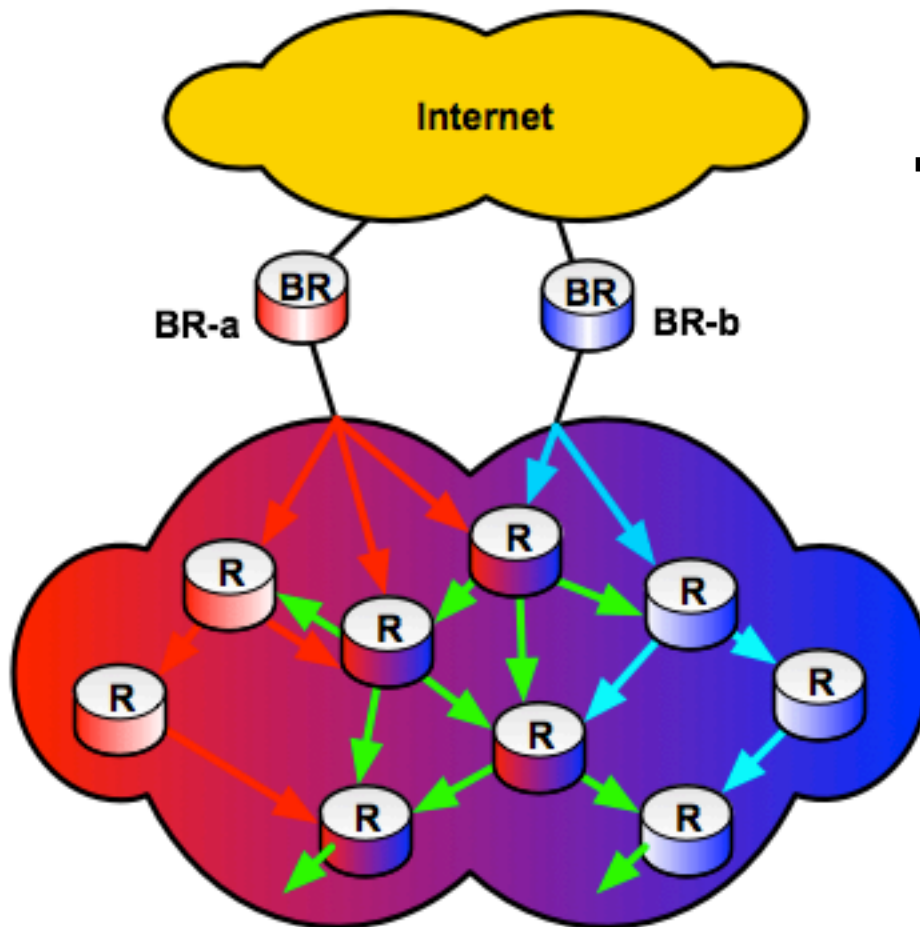
Working:

- BRs start sending BRIOs
- BRIOs piggy-backed on RA
- Routers increment metric value and re-send

Results:

- Nodes learn prefixes for BRs, with metric information
- Nodes learn DHCP addresses for relaying or for getting additional parameters (e.g. prefix delegation)

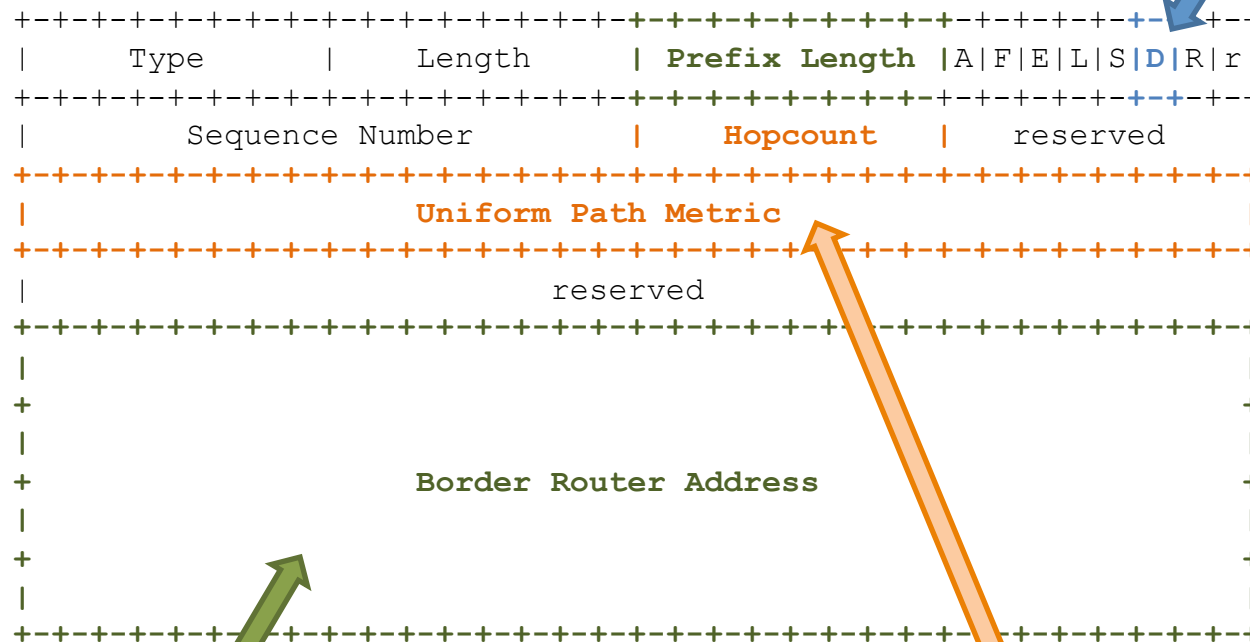
BRDP BRIO flooding with scoping (required in large MANETs)



- Reduction of propagated BRIO set is acceptable, as only the best BRIO would be used anyway

BRIO format (very similar to Prefix IO)

D=1: BR is DHCP server or relay



BR address with prefix for address generation

Metric for this prefix
Is a bidirectional metric between
DFZ and router

MANET Address generation

- **Select best Border Router based on metrics**
- **Prepend Interface Identifier with very high probability of uniqueness to Border Router prefix:**
 - **Use /64 prefixes (as Ethernet, RFC2464)**
 - **Unique 64-bit interface IDs:**
 - **EUI-64 format-based Interface Identifier [RFC4291]**
 - **Generation of randomized Interface Identifier [RFC4941]**
 - **Well-distributed hash function [RFC3972]**
- **Duplicate Address Detection ~~MAY~~/~~SHOULD~~/~~MUST~~ be used**
- **The BRDP provided metric can be used for the RFC3484 address selection policy table**
 - **To be defined in other document**

Address generation

