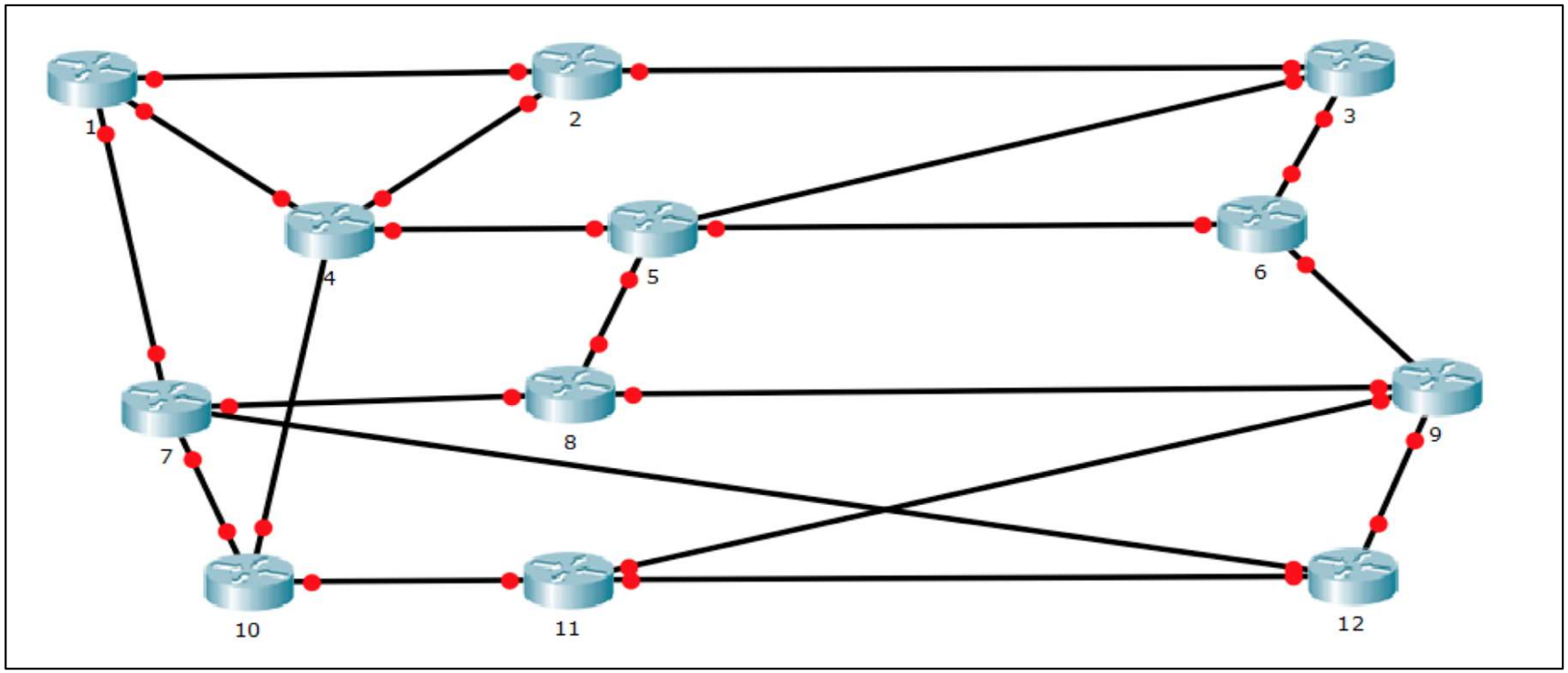
- Packets can be created with small boxes taped to toilet paper tubes. Tubes should be big enough to allow easy loading on string
- "Payload" (may candy reward?) can be placed in box.
- Nodes can be desks, tables, spots on the ground - anything that can be connected with strings
- Links can go down by cutting string.
- Nodes can be subjected to a Distributed Denial of Service (DDoS) attack by sending packets from mulitiple source nodes



Note: Not all routes are included in routing tables. More can be added if desired.

*Internet of Strings first introduced by Dakota State University

Node 1 Routing Table

Network ID	Cost	Next Hop
2	1	2
2	2	4
3	2	2
3	3	4
4	1	4
5	2	4
6	3	2
7	1	7
8	3	4
9	3	7
10	2	7
11	3	7
12	2	7

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 2 Routing Table

Network ID	Cost	Next Hop
1	1	1
3	1	3
4	1	4
5	2	4
6	2	3
7	3	4
7	2	1
8	3	4
9	4	4
10	2	4
11	5	3
12	4	3
12	5	1

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 3 Routing Table

Network ID	Cost	Next Hop
1	2	2
2	1	2
4	2	5
5	1	5
5	2	6
6	1	6
7	3	5
8	2	5
9	2	6
9	3	5
10	3	2
11	4	6
12	3	6

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 4 Routing Table

Network ID	Cost	Next Hop
1	1	1
2	1	2
3	2	5
5	1	5
6	2	5
7	2	1
8	2	5
9	3	5
9	4	10
10	1	10
10	3	1
11	2	10
12	3	10

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 5 Routing Table

Network ID	Cost	Next Hop
1	2	4
2	2	4
3	1	3
4	1	4
6	1	6
6	3	8
7	2	8
8	1	8
9	2	8
10	3	8
10	2	4
11	4	8
12	3	8

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 6 Routing Table

Network ID	Cost	Next Hop
1	3	3
2	2	3
3	1	3
4	2	5
5	1	5
7	3	9
7	4	3
8	2	9
9	1	9
10	3	9
10	5	3
11	2	9
12	2	9

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 7 Routing Table

Network ID	Cost	Next Hop
1	1	1
2	2	1
2	6	10
3	4	10
4	2	10
5	2	8
6	3	8
6	4	1
8	1	8
9	2	8
10	1	10
11	2	11
12	1	12

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 8 Routing Table

Network ID	Cost	Next Hop
1	2	7
2	3	5
3	2	5
3	4	7
4	3	7
5	1	5
6	2	9
7	1	7
7	4	5
9	1	9
10	3	9
11	3	7
12	2	7

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 9 Routing Table

Network ID	Cost	Next Hop
1	4	3
1	3	7
2	4	6
3	2	6
4	3	6
5	2	8
6	1	6
7	2	8
8	1	8
10	2	11
11	1	11
11	4	8
12	1	12

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 10 Routing Table

Network ID	Cost	Next Hop
1	2	7
2	2	4
3	3	4
3	4	11
4	1	4
5	2	4
6	4	11
7	1	7
8	2	7
9	2	11
11	1	11
12	2	11
12	5	4

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 11 Routing Table

Network ID	Cost	Next Hop
1	3	10
2	3	10
3	3	9
3	4	12
4	2	10
5	4	10
6	2	9
7	2	10
8	2	9
9	1	9
9	2	12
10	1	10
12	1	12

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again

Node 12 Routing Table

Network ID	Cost	Next Hop
1	2	7
2	3	7
3	3	9
4	3	11
5	3	7
5	4	11
6	2	9
7	1	7
8	2	9
8	2	7
9	1	9
10	2	11
11	1	11

Example Packet Header (Post-it Note)

Source: Node message started at
Destination: Node message needs to go to
Next Hop: Next hop in transmission

Process for Internet of Strings Routing

If you are originating message

1. Receive message and place in packet payload
2. Refer to your node's routing table and select the least cost route to final destination
3. Build packet header on post-it note (see example) and place on packet
4. Pace packet on link and move to the next hop

When you arrive at a node

1. Remove packet from link, review packet header and determine if message is for the node you are at.
   - If message is for this node, remove payload, verify it is at the right node, and announce results, either, **"message recevied"** or **"message misrouted"**
   - If message is not for this node, hand packet to next individual and continue with step 2 below
2. Refer to the current node's routing table and select the least cost route to final destination
   - If there is no route to final destination announce **"bad route"** and go to the end of the line for that node
   - If there is a route but the link you need is not available
     a. Check to see if there is a higher cost route available
     b. If there is a higher cost route use it and continue with number 3
     c. If there is not a higher cost route announce **"link down"**
3. Build new packet header by adding a new next hop (see example below) and place on packet
4. Place packet on link and move to next hop

If you are moving to the next hop and collide with another packet

1. Return to the node you came from
2. Pick a number between 1 and 10 and then wait that many seconds before going to the next hop again