The Arvy Distributed Directory Protocol

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Distributed Directory
Distributed Directory

Shared Token
Distributed Directory
Distributed Directory
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Arrow

[Demmer & Herlihy 1998]
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Arrow on Rings
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\[ \frac{\text{cost}_{\text{Arrow}}(\sigma)}{\text{cost}_{\text{OPT}}(\sigma)} = \Theta(n) \]
Ivy

[Li and Hudak 1986]
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Diagram showing a network of rings with numbers 1, 2, 3, and 4 connecting them.
Ivy on Rings
Ivy on Rings
Ivy on Rings

\[
\frac{\text{cost}_{Ivy}(\sigma)}{\text{cost}_{OPT}(\sigma)} = \frac{\Theta(n^2)}{\Theta(n)} = \Theta(n)
\]
Arvy
Arvy
Arvy on Rings
Arvy on Rings
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Arvy on Rings

3
Arvy on Rings
Arvy on Rings
Arvy on Rings
Arvy on Rings
Arvy on Rings
Arvy on Rings

Diagram showing a circular arrangement of nodes with arrows indicating direction and connection between nodes. The number 3 is indicated on one of the connections.
Arvy on Rings

3
Arvy on Rings
Arvy on Rings
Arvy on Rings

3
Arvy on Rings
<table>
<thead>
<tr>
<th></th>
<th>Space Per Node</th>
<th>Competitive Ratio</th>
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<tbody>
<tr>
<td><strong>Arrow</strong></td>
<td>$O(1)$</td>
<td>$\Omega(n)$</td>
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<tr>
<td><strong>Ivy</strong></td>
<td>$O(1)$</td>
<td>$\Omega(n)$</td>
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<tr>
<td><strong>Sparse Covers</strong></td>
<td>$O(\log n)$</td>
<td>$O(\log n)$</td>
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<tr>
<td><strong>Arvy</strong></td>
<td>$O(1)$</td>
<td>$O(1)$</td>
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Concurrent Requests (Arrow)
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Concurrent Requests (Arrow)
Concurrent Requests (Arvy)
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Arvy on Rings
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