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# Prototype of a ChoiceNet Economy Plane for the Future Internet Architecture

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## Introduction

ChoiceNet enables short-term contracts for network services to be established in real time. The economy plane facilitates dynamic deployment of network services over short, medium, or long time scales.

## Motivation

We believe a dynamic ecosystem will benefit users and providers equally, e.g., in the manner in which “app stores” have dramatically reshaped the market for mobile applications. For users, increased competition among service providers is expected to lead to innovation and a significant expansion in the number and variety of available network services. For service providers, on the other hand, the introduction of new, appropriately priced offerings has the potential to significantly grow the overall network services market.

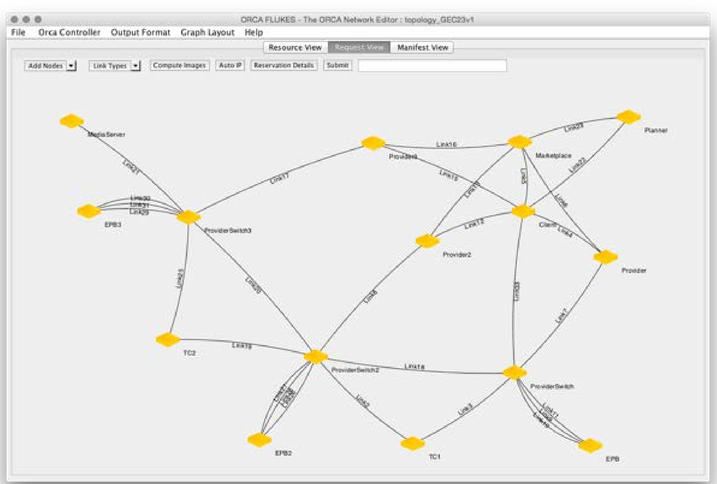


Fig 1: ExoGENI Topology

## Prototype Design

Three main entities participate in the economy plane: the marketplace, service providers, and service users. A marketplace provides the framework in which network services are offered by the providers and purchased by the users.

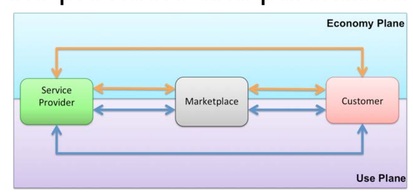


Fig 2: Entity Interaction

## Interaction

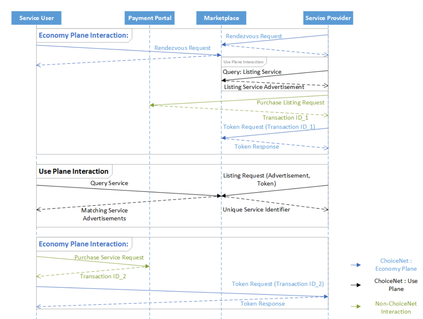


Fig 3: Complete Economy Plane Interaction

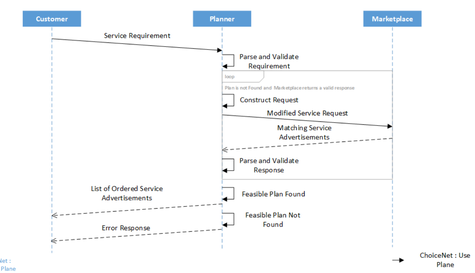


Fig 4: Use Plane Interaction

## Payment Integration

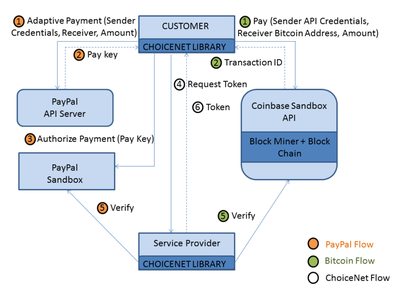


Fig 5: Money Flow

## Syntax and Semantics

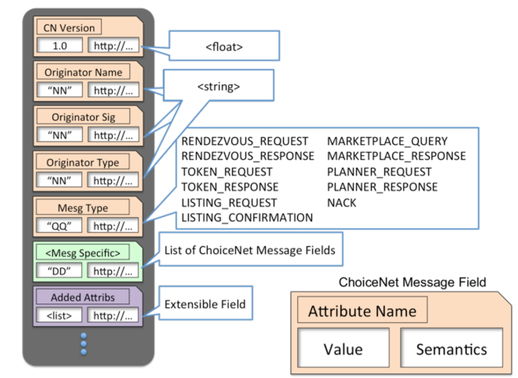


Fig 6: Message Syntax and Semantics

listing_request.xml

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<choicenetmessage>
    <field attributeName="Originator Name" url="">
        <value>ACME Transport Network</value>
    </field>
    <field attributeName="Originator Signature" url="">
        <value />
    </field>
    <field attributeName="Originator Type" url="">
        <value>Provider</value>
    </field>
    <field attributeName="Originator Provider Type" url="">
        <value>Transport</value>
    </field>
    <field attributeName="Message Type" url="">
        <value>LISTING_REQUEST</value>
    </field>
    <field attributeName="Message Specific" url="">
        <value>
            <field attributeName="Advertisement" url="">
                <value><![CDATA[<?xml version="1.0" encoding="UTF-8"
standalone="no" ?>
<listings>
    <advertisement id="1">
        <service>
            <name> Optical Circuit Transit Service</name>
            <details>
                <source_location scheme="IPv4" value="10.1.2.3/32" />
                <source_location scheme="IPv4" value="10.10.10.65/32" />
                <source_location scheme="IPv6" value="192.168.2.1/32" />
                <source_format scheme="transport media" value="optical
circuit" />
                <destination_location scheme="IPv4"
value="154.14.54.0/24" />
                <destination_format scheme="transport media"
                    value="optical circuit" />
            </details>
            <description> Optical Circuit Transit Service
            </description>
        </service>
        <price method="Bitcoin" value="1200" amount="20" unit="minutes"
```

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listing_request.xml

```
url=""/>
        <providerID> ACME Systems </providerID>
        <purchasePortal>
            <destination_location scheme="UDPv4"
value="127.0.0.1:4040" />
        </purchasePortal>
        <provisioningParameters>
            <configurableParameters>
                <mavelength unit="nonometer" value="1470, 1490, 1510,
1530, 1550" />
            </configurableParameters>
        </provisioningParameters>
    </advertisement>
</listings>

]]></value>
            </field>
            <field attributeName="Token" url="">
                <value>
                    <field attributeName="Token ID" url="">
                        <value>981493</value>
                    </field>
                    <field attributeName="Issued To" url="">
                        <value>ACME Transport Network</value>
                    </field>
                    <field attributeName="Issued By" url="">
                        <value>ABC Marketplace</value>
                    </field>
                    <field attributeName="Service Name" url="">
                        <value>Listing</value>
                    </field>
                    <field attributeName="Expiration Time" url="">
                        <value>1431099428628</value>
                    </field>
                </value>
            </field>
        </value>
    </field>
</choicenetmessage>
```

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Fig 7: Service Advertisement Example

## Acknowledgements

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