

### Contents

	Page
Introduction .....	3
Addressing .....	7
0.1 Addressing: Determining whether to use Auto-IP .....	7
0.2 Addressing: Choosing an address .....	7
0.3 Addressing: Testing the address .....	7
0.4 Addressing: Periodic checking for dynamic address availability.....	8
0.5 Addressing: Device naming and DNS interaction .....	9
0.6 Addressing: Name to IP address resolution .....	9
0.7 Addressing references .....	9
Discovery .....	10
1.1 Discovery: Advertisement .....	11
1.1.1 Discovery: Advertisement protocols and standards .....	11
1.1.2 Discovery: Advertisement: Device available -- NOTIFY with ssdp:alive .....	12
1.1.3 Discovery: Advertisement: Device unavailable -- NOTIFY with ssdp:byebye .....	15
1.2 Discovery: Search .....	16
1.2.1 Discovery: Search protocols and standards .....	16
1.2.2 Discovery: Search: Request with M-SEARCH .....	17
1.2.3 Discovery: Search: Response.....	18
1.3 Discovery references .....	20
Description .....	20
2.1 Description: Device description .....	23
2.2 Description: UPnP Device Template.....	27
2.3 Description: Service description .....	27
2.4 Description: UPnP Service Template.....	33
2.5 Description: Non-standard vendor extensions.....	33
2.6 Description: UPnP Template Language for devices.....	34
2.6.1 UPnP Template Language for devices .....	35
2.7 Description: UPnP Template Language for services.....	36
2.7.1 UPnP Template Language for services .....	37
2.8 Description: Retrieving a description .....	38
2.9 Description references .....	40
Control .....	40
3.1 Control: Protocols .....	42
3.2 Control: Action.....	42
3.2.1 Control: Action: Invoke .....	42
3.2.2 Control: Action: Response.....	45
3.3 Control: Query for variable .....	50
3.3.1 Control: Query: Invoke .....	50
3.3.2 Control: Query: Response .....	51
3.4 Control references .....	54
Eventing.....	54
4.1 Eventing: Subscription .....	56
4.1.1 Eventing: Subscribing: SUBSCRIBE with NT and CALLBACK.....	58

4.1.2	Eventing: Renewing a subscription: SUBSCRIBE with SID .....	59
4.1.3	Eventing: Canceling a subscription: UNSUBSCRIBE .....	61
4.2	Eventing: Event messages .....	62
4.2.1	Eventing: Event messages: NOTIFY .....	62
4.3	Eventing: UPnP Template Language for eventing .....	65
4.4	Eventing: Augmenting the UPnP Template Language .....	65
4.5	Eventing references.....	66
5	Presentation .....	66
5.1	Presentation references .....	68
6	Glossary.....	68