七、工作基础

通过 SNMP 协议读取 OID 信息

SNMP 协议通过读取对应 OID 来获取对应的信息。OID（Object Identifier，对象标识符又称为物联网域名）是由 ISO/IEC、ITU-T 国际标准化组织上世纪 80 年代联合提出的标识机制，采用分层树形结构对任何类型的对象（包括实体对象、虚拟对象、复合对象等）进行全球无歧义、唯一命名。OID 具有分层灵活、扩展性强、跨异构系统等优势，并可兼容现有标识机制，已经广泛应用于信息安全、医疗卫生、网络管理等领域。[2]

SNMP 读取 OID 信息，有 GET 和 WALK 两种方式：GET 为获取当前节点的值，WALK 为获取当前节点所有子节点的值。

1） GET 方式获取 SNMP 的值：

```
/// <summary>
/// GET方法获取SNMP信息
/// </summary>
/// <param name="host">服务器名或IP</param>
/// <param name="key">SNMP口令</param>
/// <param name="oid">OID</param>
/// <returns></returns>
private string GetOidData(string getoidname, string host, string key, string oid)
{
    string str = string.Empty;
    try
    {
        OctetString community = new OctetString(key);
        // Define agent parameters class
        AgentParameters param = new AgentParameters(community);
        // Set SNMP version to 1 (or 2)
        param.Version = SnmpVersion.Ver1;
        // Construct the agent address object
        // IpAddress class is easy to use here because
        //  it will try to resolve constructor parameter if it doesn't
        //  parse to an IP address
        IpAddress agent = new IpAddress(host);
        // Construct target
        UdpTarget target = new UdpTarget((IPAddress)agent, 161, 2000, 1);
        // Pdu class used for all requests
        Pdu pdu = new Pdu(PduType.Get);
        pdu.VbList.Add(oid); //sysName
        // Make SNMP request
        SnmpV1Packet result = (SnmpV1Packet)target.Request(pdu, param);
        // If result is null then agent didn't reply or we couldn't parse the
reply.
```

```
                if (result != null)
                {
                    // ErrorStatus other then 0 is an error returned by
                    // the Agent - see SnmpConstants for error definitions
                    if (result.Pdu.ErrorStatus != 0)
                    {
                        // agent reported an error with the request
                        log.Error(host + " " + (string.Format("Error in SNMP reply. Error {0} index {1}",result.Pdu.ErrorStatus,result.Pdu.ErrorIndex)));
                    }
                    else
                    {
                        // Reply variables are returned in the same order as they were added
                        str = result.Pdu.VbList[0].Value.ToString().Trim();
                    }
                }
                else
                {
                    log.Error(host + " ,No response received from SNMP agent.");
                }
                target.Close();
            }
            catch (Exception ex)
            {
                log.Error(ex.Message);
                str = "";
            }
            return str;
        }
```

2） 通过 WALK 方式获取 SNMP 的值

```
/// <summary>
        /// WALK方法获取SNMP信息
        /// </summary>
        /// <param name="walkoidname"></param>
        /// <param name="host">服务器名或IP</param>
        /// <param name="key">SNMP口令</param>
        /// <param name="oid">OID</param>
        /// <returns></returns>
        private List<SnmpResult> GetOidList(string walkoidname, string host, string key, string oid)
        {
            List<SnmpResult> slist = new List<SnmpResult>();
            try
            {
                SimpleSnmp snmp = new SimpleSnmp(host, key);
                if (!snmp.Valid)
                {
                    log.Error(host + " , " + walkoidname + " ,SNMP agent host name/ip
address is invalid.");
                    slist.Clear();
                    return slist;
                }
                Dictionary<Oid, AsnType> result = snmp.Walk(SnmpVersion.Ver2, oid);
                if (result == null)
                {
                    log.Error(host + " , " + walkoidname + " ,No results received.");
                    slist.Clear();
                    return slist;
                }
                if (result.Count > 0)
                {
                    foreach (KeyValuePair<Oid, AsnType> kvp in result)
                    {
                        slist.Add(new SnmpResult()
                        {
                            Oid = kvp.Key.ToString(),
                            Type = SnmpConstants.GetTypeName(kvp.Value.Type),
                            Value = kvp.Value.ToString().Trim()
                        });
                    }
                }
                else
                {
                    log.Error(host + ",Results Count is zero.");
                    slist.Clear();
                    return slist;
                }
            }
            catch (Exception ex)
            {
                log.Error(ex.Message);
                slist.Clear();
            }
            return slist;
        }
```